FACT SHEET

NPDES Permit Number:	ID0027022
Public Notice Start Date:	June 24, 2002
Public Notice Expiration Date:	July 24, 2002
Technical Contact:	Kristine Koch, (206) 553-6705 1-800-424-4372 ext. 6705 (within Region 10) koch.kristine@epa.gov

The U.S. Environmental Protection Agency (EPA) Proposes to Reissue a Wastewater Discharge Permit to:

Meridian Beartrack Company
Beartrack Mine
P.O. Box 749
Salmon, Idaho 83467

and

the State of Idaho Proposes to Certify the Permit

EPA Proposes NPDES Permit Reissuance

EPA proposes to reissue the existing National Pollutant Discharge Elimination System (NPDES) permit to the Meridian Beartrack Company (MBC) Beartrack Mine. The draft permit sets conditions on the discharge of pollutants from the Beartrack Mine to Napias Creek. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current and proposed discharges
- a listing of proposed effluent limitations and other conditions
- a map and description of the discharge locations
- background information supporting the conditions in the draft permit

The State of Idaho Proposes Certification

The Idaho Division of Environmental Quality (IDEQ) proposes to certify the NPDES permit for the Beartack Mine under section 401 of the Clean Water Act. The IDEQ did not submit a preliminary 401 certification prior to the public notice.

Public Comments on the Draft Permit

Persons wishing to comment on or request a public hearing for the draft permit may do so in writing by the expiration date of the public notice. A request for a public hearing must state the nature of the issues to be raised, as they relate to the permit, as well as the requester's name, address, and telephone number. All comment and requests for public hearings must be in writing and submitted to EPA as described in the Public Comments section of the attached public notice. After the public notice expires, and all substantive comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

Public Comment on the State Preliminary 401 Certification

The Idaho Division of Environmental Quality (IDEQ) provides the public with the opportunity to review and comment on preliminary 401 certification decisions. Any person may request in writing that IDEQ provide that person notice of IDEQ's preliminary 401 certification decision, including, where appropriate, the draft certification. Persons wishing to comment on the preliminary 401 certification should submit written comments by the public notice expiration date to the Idaho Division of Environmental Quality (IDEQ), Idaho Falls Regional Office, 900 N. Skyline, Idaho Falls, ID 83402.

Documents are Available for Review

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (see address below).

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-0523 or
1-800-424-4372 (within Alaska, Idaho, Oregon, and Washington)

The fact sheet and draft permit are also available at:

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

Idaho Division of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline
Idaho Falls, Idaho 83402
(208) 528-2650

Salmon Public Library
204 Main Street
Salmon, Idaho 83467-4111
(208)756-2311

The draft permit and fact sheet can also be found by visiting the Region 10 website at http://www.epa.gov/r10earth.htm.

For technical questions regarding the permit or fact sheet, contact Kristine Koch at the phone numbers or email address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to Kristine Koch at the above phone numbers). Additional services can be made available to a person with disabilities by contacting Kristine Koch.

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LIST OF ACRONYMS

AHFR	Average high flow rate
ALFR	Average low flow rate
AML	Average Monthly Limit
AWQC	Ambient Water Quality Criteria
BADT	Best Available Demonstrated Control Technology
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BO	Biological Opinion
BPJ	Best Professional Judgement
BPT	Best Practicable Control Technology
CFR	Code of Federal Regulations
cfs	cubic feet per second
CV	coefficient of variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Division of Environmental Quality
LTA	Long-term Average
MBC	Meridian Beartrack Company
MDL	maximum daily limit
:g/L	micrograms per liter
mgd	million gallons per day
MZ	mixing zone
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NTR	National Toxics Rule
QAP	Quality Assurance Plan

LIST OF ACRONYMS cont.

R	Ratio ALFR to AHFR
RP	Reasonable Potential
RPA	Reasonable and Prudent Alternatives
RPM	Reasonable Potential Multiplier
TSD	Technical Support Document (EPA 1991)
TSS	Total Suspended Solids
TU	Toxic Unit (TU_c = chronic toxic unit)
USFS	Unites States Forest Service
USFWS	United States Fish and Wildlife Service
WAD	Weak Acid Dissociable
WET	Whole Effluent Toxicity
WLA	Wasteload Allocation

I. APPLICANT

Meridian Beartrack Company
NPDES Permit No.: ID-002702-2

Mailing Address:	P.O. Box 749 Salmon, Idaho 83467
Facility Location:	See Part II.A and Figure A-1 in Appendix A
Facility Contact:	Joe Woods, Site Manager (208) 756-6300 ext. 3032

II. FACILITY ACTIVITY

A. General

The Beartrack Mine is an open pit, cyanide heap leach gold mine located in east central Idaho, near the historic town of Leesburg in Lemhi County, Idaho, within the Salmon National Forest (see Figure A-1). The mine is currently owned and operated by the Meridian Beartrack Company (MBC). Construction and operation of the mine began in 1994 and gold production began in 1995 upon completion of the heap leach pad. The Beartrack Mine has recently evolved from an operating mine to a mine undergoing final gold recovery, reclamation and closure. The mine is currently in the reclamation and closure phase. MBC has also ceased all mining operations on March 22, 2000 and has ceased production of gold from the heap leach on June 22, 2000.

The Beartrack Mine is located on private land, patented claims, and lands administered by the United States Forest Service (USFS). The land affected by the Beartrack Mine includes about 700 acres of the total 3,795 acres within the original project boundary defined in the Final Plan of Operations (Meridian, 1991) and the Final Environmental Impact Statement (USFS, 1991). Of the land affected by the Mine, approximately 77% is public land administered by the USFS.

The mine site involves two separate ore deposits that were mined by open pit methods, a waste rock disposal site and heap leaching facilities located near the pits. The two open pits, North and South, that were originally constructed affect a total area of about 129 acres. A third relatively small pit (less than ten acres), the Mason Dixon Pit, was constructed in 1999. Other facilities include a process plant, process water ponds, sediment ponds, warehouse and maintenance building, administration building, laboratory, and fuel storage tanks. The site facilities are interconnected by haul roads, service roads, and the main access route. Figure A-2 presents the general mine site layout.

Wastewater discharged from the mine will include storm water run-off and heap leach rinsate. The wastewater is discharged through Outfall 001 to Napias Creek. The storm water is treated at an onsite treatment plant with flocculent to settle suspended particles.

B. Mining Operations

During mining operations, ore and waste rock were removed from the pits in horizontal benches. An ammonium nitrate/fuel oil mixture is used to blast ore out of one of two pits – the North Pit or the South Pit. The ore was then moved via haul trucks to the process area while the waste rock was transported to the waste rock disposal area. Waste rock (i.e., blasted rock containing too little ore to process) was placed in Wards Gulch, 174 acres capable of holding 40 million tons of rock. Currently, much of the site has either been reclaimed or is undergoing reclamation under the direction of the USFS.

Gold was extracted from the ore deposits by cyanide heap leaching. The ore was crushed, shaped, and placed in twenty-foot layers on the heap leach pad. Solution made from sodium cyanide is spayed over the top of the heap. The solution bonds with the gold in the ore, percolates through the heap, and drains into catch basins. A processing plant pumped the sodium cyanide gold-bearing solution from the catch basins to carbon absorption tanks where the gold adheres to activated carbon. The gold was recovered from the loaded carbon through zinc precipitation. The "used" sodium cyanide was sent to a barren solution pond.

For use in the mining process, the Mine required the transportation of toxic materials, including the following per month: 1,500 tons of quick lime, 250 tons of antiscalent agent, 7.9 tons of hydrochloric acid, 6.6 tons of caustic soda, and 175,000 gallons of fuel oil.

C. Reclamation and Closure Operations

The intent of the reclamation program is to reclaim mining related disturbance, where conditions and current reclamation technology reasonably permit, to protect public health, safety and welfare, conserve natural resources, aid in the protection of wildlife, domestic animals and aquatic resources and reduce soil erosion.

The Idaho Department of Lands (IDL) is the primary state agency with requirements for reclamation of surface mines (IDAPA 20.03.02). At the onset of this project in 1990, MBC developed a Reclamation Plan in accordance with the requirements of IDL. The general reclamation goal at the Beartrack Project is to reclaim the site to allow essentially the same land uses as existed prior to the project. Therefore, the reclamation plan proposes to restore a tree-shrub-grassland vegetation type on most of the site. The reclaimed landscape will also contain small areas of wetland vegetation where topographic conditions, aspect, and drainage conditions are conductive to establishment of these types of communities.

Reclamation activities have been scheduled to occur as soon as possible after the mining activities in a particular area are completed to minimize erosion and sedimentation problems. Therefore, MBC has been undergoing reclamation of the Beartrack Mine in accordance with their Reclamation Plan and subsequent amendments since 1998.

Reclamation activities include mine areas, waste rock disposal areas, heap leach facilities, roads, diversions/sediment control structures, ancillary facilities, and previously abandoned mine land. A brief discussion and status of each of these activities is provided in Appendix B.

III. FACILITY BACKGROUND

A. Permit History

EPA first issued a National Pollutant Discharge Elimination System (NPDES) permit for the Beartrack Mine on September 30, 1991. The current permit expired on October 30, 1996. A timely application for renewal of the permit was submitted to EPA on April 29, 1996. The renewal application included discharges from five outfalls, three existing and two proposed. A Supplemental Information Report was submitted by MBC in early May 2000 (received by EPA on May 8, 2000) to supplement their permit application to reflect updated mining operations and water management under the closure phase. Since the mine is now entering the closure phase, only one outfall (Outfall 001, existing) will be required. A description of the waste streams that contribute to the discharge is provided in Appendix C. Because MBC submitted a timely application for renewal, the 1991 permit has been administratively extended and remains fully effective and enforceable until reissuance.

B. Compliance History

MBC submits monthly discharge monitoring reports (DMRs) to EPA summarizing the results of effluent monitoring required by the permit. There were no effluent limit violations noted based on review of the past five years' DMRs.

IV. RECEIVING WATER

A. Location of Discharge

The permittee has applied for the discharge of Outfall 001 to Napias Creek. The Mine is located in the Napias Creek drainage approximately 7.5 miles upstream from its confluence with Panther Creek, and about 22 miles upstream from the confluence of Panther Creek and the main stem Salmon River. The Mine is within the Middle Salmon-Panther Subbasin, HUC 17060203 and part of the Panther Creek Watershed. The mine affects approximately 740 acres of land in the Napias Creek drainage. Tributary streams that contribute to Napias Creek include (going downstream) Sawpit Creek, Smith Gulch, Sharkey Creek, Wards Gulch, Camp Creek, Jefferson Creek, Arnett Creek, Rabbit Creek, Pony Creek, Cat Creek, Missouri Gulch, Phelan Creek, Mackinaw Creek, and Moccasin Creek.

B. Water Quality Standards

As discussed in Section A, the MBC outfall discharges to Napias Creek. The *Idaho Water Quality Standards and Wastewater Treatment Requirements* designate beneficial uses for waters of the State. This water body is undesignated, therefore, it is classified by the state of Idaho for protection of the following uses: (1) cold water biota, (2) salmonid spawning, (3) secondary contact recreation, (4) agricultural water supply, (5) industrial water supply, (6) wildlife habitats, and (7) aesthetics.

The State water quality standards specify water quality criteria that are deemed necessary to support the use classifications. These criteria may by numerical or narrative. The water quality criteria applicable to the proposed permit are provided in Appendix D (Section III.B.). These criteria provide the basis for most of the effluent limits in the draft permit.

V. EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. A technology-based effluent limit requires a minimum level of treatment for point sources based on currently available treatment technologies. A water quality-based effluent limit is designed to ensure that the water quality standards of a water body are being met. Appendix D provides discussion on the legal basis for the development of technology-based and water quality-based effluent limits.

The information provided to EPA in the permit application process indicates that the permittee may have difficulty meeting the proposed effluent limitations for all the metals and may need to investigate means to reduce the concentrations in their effluent prior to discharging to Napias Creek.

B. Proposed Effluent Limitations

Table 1 summarizes the effluent limitations that are proposed in the draft permit. For comparison purposes, the table also shows the effluent limitations of the current permit. In addition to the limitations in Table 1, the draft permit prohibits the permittee from discharging any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

Table 1: Comparison of Current and Proposed Effluent Limitations for Outfall 001							
Parameter[1]	Units	Current Effluent Limitations		Proposed Effluent Limitations			
				Low Flow[2]		High Flow[3]	
		Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Monthly Average	Maximum Daily
Ammonia	mg/l	---	---	7.8	6.6	16	13
	lb/day	---	---	20	58	40	110
Arsenic	ug/l	5800	9500	---	---	---	---
	lb/day	52.7	86.3	---	---	---	---
Cadmium	ug/l	5.0	9.0	1.4	1.3	2.7	2.7
	lb/day	<0.05	0.08	0.0035	0.011	0.0068	0.024
Chromium	ug/l	1300	2100	---	---	---	---
	lb/day	9.0	12.0	---	---	---	---
Copper	ug/l	40	60	11	12	21	24
	lb/day	0.36	0.5	0.028	0.11	0.053	0.35
Cyanide (WAD)	ug/l	---	---	19	18	37	36
	lb/day	---	---	0.048	0.16	0.093	0.32
Iron	mg/l	30.4	50.0	---	---	---	---
	lb/day	276	455	---	---	---	---
Lead	ug/l	5.0	9.0	6.9	6.8	14	14
	lb/day	<0.05	0.08	0.017	0.060	0.035	0.12

Table 1: Comparison of Current and Proposed Effluent Limitations for Outfall 001							
Parameter[1]	Units	Current Effluent Limitations		Proposed Effluent Limitations			
				Low Flow[2]		High Flow[3]	
		Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Monthly Average	Maximum Daily
Mercury	ug/l	0.4	0.6	0.043	0.042	0.086	0.084
	lb/day	<0.004	<0.005	0.00011	0.00037	0.00022	0.00074
pH	su	6.0 to 9.0		within the range of 6.5 - 9.0		within the range of 6.5 - 9.0	
Selenium	ug/l	---	---	18	17	36	35
	lb/day	---	---	0.045	0.15	0.090	0.31
Silver	ug/l	---	---	0.66[4]	0.74[4]	1.3	1.5
	lb/day	---	---	0.0017	0.0065	0.0033	0.013
TSS	mg/l	20	30	20	30	20	30
	lb/day	182	273	50	180	75	260
Zinc	ug/l	300	500	75	87	150	170
	lb/day	<2.7	4.5	0.19	0.76	0.38	1.5

Footnotes:
1. Metals are to be measured as total recoverable, except for mercury which is to be measured as total.
2. The effluent limitations for the low flow period apply from July 1 through April 30.
3. The effluent limitations for the high flow period apply from May 1 through June 30.
4. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 1.0 u/L using EPA Method 272.2.

C. Antibacksliding

The proposed permit does not include effluent limitations for arsenic, chromium, and iron, even though these parameters were limited in the current permit. Section 402(o) of the Clean Water Act prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit. There are, however, exceptions to the prohibition that allow the establishment of less stringent limits.

The exception that applies to this circumstance is that new information is available that was not available at the time of permit issuance which would have justified a less stringent effluent limitation. At the time the current permit was issued, the permittee was a “new discharger” and did not have data on the proposed discharge because they had not commenced operation. Therefore, the current permit was based on expected effluent characteristics. Since the issuance of the current permit, MBC has been sampling their discharge and the receiving water in vicinity of their discharge. Hence, EPA had actual measured data to evaluate the effects of the receiving water for the reissuance of this permit. The measured data shows that effluent limitations are not necessary for arsenic, chromium, and iron.

D. Analytical Methods

Some of the water quality-based effluent limits in the draft permit are close to the capability of current analytical technology to detect and/or quantify the concentration of that parameter. To address this concern, the draft permit contains a provision requiring MBC to use analytical methods that can quantify the effluent limitation. For parameters with effluent limits that cannot be quantified (i.e., cadmium, copper, lead and silver), the draft permit proposes that the compliance level with that limit is the quantification level of the best analytical technology approved by EPA in 40 CFR 136.

VI. MONITORING REQUIREMENTS

A. Basis for Effluent Monitoring

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Section 308 also allows additional effluent monitoring to gather information for future effluent limitations or to monitor effluent impacts on receiving water quality. MBC is responsible for conducting the monitoring and reporting the results to EPA on monthly DMRs and in annual reports. Table 2 presents the proposed effluent monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The monitoring frequencies proposed in the draft permit are generally the same as those in the current permit.

Table 2: Comparison of Current and Proposed Effluent Monitoring Requirements						
Parameter	Current Permit			Draft Permit		
	Units	Sample Frequency	Sample Type	Units	Sample Frequency	Sample Type
Ammonia	---	---	---	mg/l	weekly	grab
Cyanide (WAD)	---	---	---	ug/l	weekly	grab
Flow	mgd	continuous	recording	mgd	continuous	recording
Metals (Cd, Cu, Pb, Ni, Hg, Se, Ag, Zn)	ug/l	weekly	grab	ug/l	weekly	grab
Mass-based Limits	---	---	---	lb/day	---	calculated
TSS	mg/l	weekly	grab	mg/l	weekly	grab
pH	su	daily	grab	su	weekly	grab
Hardness, as $CaCO_3$	---	---	---	mg/l	weekly	grab
Temperature	---	---	---	^oC	weekly	grab
Chronic WET	NOEC	twice per year[1]	grab	TU_c	twice per year[2]	grab

Footnotes:
1. Test shall be performed in May and October for the first year of waste rock disposal operations, and again in May and October during the 12 months preceding the expiration date of the current permit.
2. Monitoring shall be performed in May and October.

B. Basis for Whole Effluent Toxicity Monitoring

The draft permit requires whole effluent toxicity (WET) tests twice per year during significant rainfall or snowmelt (i.e., May and October) to measure the chronic toxicity of the discharge. Results of these tests will be used to ensure that toxics in the effluent are controlled and to determine the need for future WET limits. Monitoring and analyses of the effluent for WET is warranted based on the prevalence of metals in the discharge.

The draft permit establishes trigger levels that, if exceeded, would trigger additional WET testing and/or an evaluation to reduce toxicity. The trigger levels were calculated based on the chronic WET criterion of 1 TUc, the probability of acute toxic affects based on EPA's recommendation of 0.3 TUa, and a dilution ratio of 25:1. The trigger levels proposed in the draft permit are 17 TUc during the low flow period and 16 TUc during the high flow period. These triggers were based on calculations found in Chapters 1 and 5 of the TSD (see Section IV of Appendix D for details).

C. Basis for Surface Water Monitoring

The purpose of surface water monitoring is to determine water quality conditions as part of the effort to evaluate the reasonable potential for the discharge to cause an instream excursion above water quality criteria. Upstream monitoring is used to determine water quality impacts of the NPDES discharge while downstream monitoring is used to ensure compliance with the water quality standards. This data will be used during the next permitting cycle to determine the need for incorporating and retaining water quality-based effluent limits into the permit. Since the purpose of surface water monitoring is to determine water quality impacts due to the effluent discharge, surface water monitoring is required to occur on the same date as effluent monitoring, to the extent possible.

The water quality monitoring requirements in the draft permit are, for the most part, unchanged from the current permit. The draft permit requires MBC to continue this monitoring as it relates to the permitted discharges by specifying monitoring at selected locations upstream and downstream of the discharge. Table 3 presents the proposed surface water monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit.

Table 3: Comparison of Current and Proposed Surface Water Monitoring Requirements						
Parameter	Current Permit			Draft Permit		
	Units	Sample Frequency	Sample Type	Units	Sample Frequency	Sample Type
Ammonia	---	---	---	mg/L	2/month	grab
Cyanide (WAD)	ug/L	weekly	grab	ug/L	2/month	grab
Floating Solids or Visible Foam	---	---	---	---	2/month	visual
Flow	cfs	daily	measurement	cfs	daily	measurement
Metals (Cd, Cu, Pb, Hg, Ni, Se, Ag, Zn)	ug/L	2/month	grab	ug/L	2/month	grab
TSS	mg/L	2/month	grab	mg/L	2/month	grab
pH	s.u.	2/month	grab	s.u.	2/month	grab
Hardness, as $CaCO_3$	---	---	---	mg/L	2/month	grab
Temperature	---	---	---	°C	2/month	grab

D. Sample Type

The following sample types are proposed in the draft permit:

1. Visual. The only way to adequately measure a discharge for floating solids, foam, and oily sheens is to conduct a visual analysis of the receiving waterbody to determine the presence or absence.

2. Grab. Grab samples are appropriate for parameters (e.g., pH and cyanide) that are likely to change with storage or for parameters (e.g., TSS) that are not likely to change over time. For this discharge, grab sampling for WET is more appropriate because the probability of peak toxicity occurring in a short duration.

3. Calculated. Since effluents are analyzed for concentrations, it is appropriate to calculate the loadings for parameters (e.g., TSS and metals) by multiplying the measured concentration by the flow and a conversion factor to ensure the appropriate units are reported. For example, a concentration in mg/L is converted to a loading of lb/day by multiplying the concentration by the flow in mgd and a conversion factor of 8.34.

4. Continuous. Since the discharge is dependent upon precipitation, continuous monitoring of effluent flow is necessary to determine how the effluent flow varies in relation to the receiving water flow.

E. Representative Sampling

The draft permit has expanded the requirement in the federal regulations regarding representative sampling (40 CFR 122.41[j]). This provision now specifically requires representative sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This provision is included in the draft permit because routine monitoring could miss permit violations and/or water quality standards exceedences that could result from bypasses, spills, or non-routine discharges. This requirement directs MBC to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

Federal regulations at 40 CFR 122.41(e) require permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." To implement this requirement, the current permit required MBC to submit a Quality Assurance Plan (QAP) within 90 days of the effective date of the permit (October 30, 1996). The most recent version of this plan is entitled *meridian Gold Company - Beartrack Mine, Water Quality Monitoring, Quality Control and Quality Assurance Program*, Revision II, January 1997.

The EPA Region 10 Quality Assurance (QA) Unit has reviewed MBC's QAP for the Beartrack Mine and has found several shortcomings. The draft permit requires that MBC modify their Quality Assurance Plan (QAP) to address the shortcomings identified by the QA Unit to ensure that the monitoring data submitted is accurate.

The draft permit requires MBC to submit the modified QAP to EPA within 60 days of the effective date of the permit and implement the QAP within 120 days of the effective date.

B. Best Management Practices Plan

Section 402 of the Clean Water Act and federal regulations at 40 CFR 122.44(k)(2) and (3) authorize EPA to require best management practices (BMPs) in NPDES permits. BMPs are measures that are intended to prevent or minimize the generation and the potential for release of pollutants from industrial facilities to waters of the U.S. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires MBC to prepare and implement a BMP Plan within 180 days of permit issuance. The BMP Plan is intended to achieve the following objectives: minimize the quantity of pollutants discharged from the facility, reduce the toxicity of discharges to the extent practicable, prevent the entry of pollutants into waste streams, and minimize storm water contamination. The BMP Plan will apply to all components of the Beartrack Mine. The draft permit requires that the BMP Plan be maintained and that any modifications to the facility are made with consideration to the effect the modification could have on the generation or potential release of pollutants. The BMP Plan must be revised if the facility is modified and as new pollution prevention practices are developed.

The draft permit also requires comprehensive site compliance evaluations documenting the compliance evaluations, observations related to implementation of the BMP Plan, any incidents of non-compliance, and any corrective actions and BMP Plan modifications over the year.

C. Standard Permit Provisions

In addition to facility-specific requirements, most of sections II, IV, and V of the draft permit contain “boilerplate” requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because the boilerplate requirements are based on regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

VIII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (collectively referred to as the Services) if their actions could beneficially or adversely affect any threatened or endangered species. The Services have identified several threatened and endangered species in the vicinity of the Beartrack Mine discharge. Appendix E provides further information on the listed species.

EPA is currently undergoing informal consultation with the NMFS and USFWS. As part of the consultation, EPA is preparing a Biological Evaluation (BE) to evaluate the potential impacts of the NPDES discharge on the endangered and threatened species. If the consultation results in reasonable and prudent alternatives or measures that require more stringent permit conditions, EPA will incorporate those conditions into the final permit.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The

Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. An assessment of EFH is provided in Appendix F. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge, therefore no consultation is required. This fact sheet and the draft permit will be submitted to NMFS for review during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to final issuance of this permit.

C. National Environmental Policy Act

In compliance with EPA headquarter policy guidance for reissued NPDES permits to new source dishcargers, the EPA Region 10 National Environmental Policy Act (NEPA) Compliance Program has assessed the need to re-evaluate the NEPA analysis in regard to the reissuance of the proposed NPDES permit to MBC for the Beartrack Mine. Since the proposed permit conditions are equal to or more stringent that the current NPDES permit and there have not been, nor are there going to be, any proposed changes to any other aspects of the applicant's operations, EPA does not consider the proposed NPDES permit to constitute a significant change warranting the need to undertake a new NEPA analysis. Therefore, EPA Region 10 has determined that the previous Environmental Impact Statement developed in June 1991 does not need to be amended with a new NEPA analysis. The finding of no significant impact from the NEPA analysis in the Final Environmental Impact Statement developed in June 1991 is incorporated here by reference.

D. State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the state to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law. The state of Idaho did not provide EPA with a preliminary certification of this permit.

After the public comment period, a proposed final permit will be sent to IDEQ for final certification. If IDEQ authorizes different requirements in its final certification, EPA will incorporate those requirements into the permit. For example, if the State authorizes different mixing zones in its final certification, EPA will recalculate the effluent limitations in the final permit based on the dilution available in the final mixing zones.

E. Antidegradation

In setting permit limitations, EPA must consider the State's antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters, antidegradation requires that the State find that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the State makes the determination that it is necessary.

The current permit has effluent limitations for arsenic, chromium and iron for outfall 001. Since the reasonable potential analysis indicated no reasonable potential to cause or contribute to an exceedence of water quality criteria, limits for arsenic, chromium, and iron were not included in the draft permit.

Because the effluent limits in the draft permit are based on current water quality criteria or technology-based limits that have been shown to not cause or contribute to an exceedence of water quality standards the discharges as authorized in the draft permit will not result in degradation of the receiving water. Therefore, the conditions in the permit will comply with the State's antidegradation requirements.

F. Permit Expiration

This permit will expire five years from the effective date of the permit.

APPENDIX A - MERIDIAN BEARTRACK COMPANY (MBC) FACILITY MAP

<insert facility map>

APPENDIX B - RECLAMATION AND CLOSURE ACTIVITIES

As a supplement to Section II of the Fact Sheet, this appendix describes reclamation and closure activities at the Beartrack Mine. This section is broken into the following seven phases of reclamation proposed by MBC: mine areas (Section I), waste rock disposal areas (Section II), heap leach facilities (Section III), roads (Section IV), diversions and sediment control structures (Section V), ancillary facilities (Section VI), and abandoned mine lands (Section VII). Each section provides a brief description of the reclamation activities, the activities that have been completed, the activities that are to be completed during the term of the proposed permit, and the activities that will be completed beyond the term of the proposed permit.

I. Mine Areas

A. Reclamation Activities

The mine areas are to be reclaimed to create a safe and stable topographic feature which can be used by livestock and wildlife. The North Pit and Mason/Dixon Pit will be reclaimed into a mixture of wetlands, meadow, cliffs, and talus slopes, all surrounded by a dense pine and fir forest. However, the South Pit will be reclaimed to a lake.

Reclamation of the North Pit and Mason/Dixon Pit include the following activities: sculpting of highwalls to create an irregular cliff or bluff-type landscape suitable for raptor nesting; sculpting, molding, backfilling, and over-vegetation of benches to create a stable land form, precipitation and snowmelt drainage area, and visual continuity; coversoil and revegetation of the pit floor to create a meadow for enhanced livestock grazing; revegetating the edge of the access/haul roads with shrubs and grasses to create a corridor and cover for wildlife and livestock ingress and egress; and creation of a wetland in the southern portion of the pit floor to provide wetland functions including sediment stabilization, nutrient retention and wildlife habitat.

The following activities are included in the reclamation of the South Pit: accelerated fill of the pit until the water level reaches equilibrium with the bedrock aquifer to create a lake suitable for livestock and wildlife watering, and potentially a fishery depending on the water quality; creation of cover areas and revegetation of the edge of the pit lake; sculpting of highwalls to create an irregular cliff or bluff-type landscape suitable for raptor nesting; and sculpting, molding, backfilling, and over-vegetation of remaining exposed benches to create a stable land form, precipitation and snowmelt drainage area, and visual continuity.

B-2

B. Completed Reclamation Activities

Reclamation activities that have occurred thus far include:

North Pit: Approximately 70% of the North pit has been backfilled.

Mason/Dixon Pit: Sculpting, backfilling, and seeding.

South Pit: Partial fill of the pit.

C. Current Reclamation Activities

Reclamation activities that will take place during the effective period of the proposed NPDES permit include:

North Pit: Finish backfilling, capping and revegitation.

Mason/Dixon Pit: Ensure adequate vegetation growth for sediment stability.

South Pit: Construct treatment wetlands and finish rapid fill of the pit.

D. Future Reclamation Activities

Future reclamation activities include:

North Pit: Ensure adequate vegetation growth for sediment stability.

South Pit: Ensure water level reaches equilibrium with the bedrock aquifer to create a lake suitable for livestock and wildlife watering; determine whether or not the water quality will support a fishery; ensure effectiveness of treatment wetlands; create cover areas and revegetate the edge of the pit lake; sculpt highwalls to create an irregular cliff or bluff-type landscape; and sculpt, mold, backfill, and over-vegetate remaining exposed benches to create a stable land form, precipitation and snowmelt drainage area, and visual continuity.

II. Waste Rock Disposal Areas

A. Reclamation Activities

The waste rock disposal area will be reclaimed to blend into the surrounding topography to the extent practical. The waste rock dump will be constructed from the head of the valley in a downslope direction by conventional truck haul/end methods. The active face of the dump will be regraded to achieve an overall slope of 3:1. The crest of the disposal areas will be rounded where practical, and drainages will be maintained on either side of the area. Intermediate waste dump benches will be graded to drain to the back and out each side of the disposal area to the drainages. The uppermost surface of the dump will be sloped to the back into the side of the hill to prevent runoff and erosion over the face. The benches and top of the disposal area will be covered with soil and revegetated.

B. Completed Reclamation Activities

Reclamation activities that have occurred thus far include approximately 50% of the grading.

C. Current Reclamation Activities

Reclamation activities that will take place during the effective period of the proposed NPDES permit include completion of grading, soil covering, and revegetation.

D. Future Reclamation Activities

Future reclamation activities include ensuring adequate vegetation growth for sediment stability and effectiveness of drainages.

III. Heap Leach Facilities

A. Reclamation Activities

The heap leach facilities include the heap, the processing pond and the ditch connecting the heap to the processing pond. The reclamation of this area is broken into the following phases: heap rinsing, heap grading and cover, solution pond reclamation, and ditch reclamation.

The purpose of rinsing the heap is to remove the cyanide that was used during the gold recovery process during mining operations. The rinsing process begins by spraying water over the heap. Then the rinse water will discharge at the toe of the heap, travel through the existing collection ditch to the existing solution ponds. Finally, the rinse water from the solution ponds will either be managed by reusing for further rinsing or by discharging to Outfall 001. Rinsing of the heap will be accomplished by natural precipitation and snowmelt, using fresh water, or using treated water from the solution ponds. The heap will be rinsed until the WAD cyanide concentrations in the recovery water from the heap reach a concentration of 0.2 mg/L.

Once the rinsing phase is complete, the heap will be graded to eliminate the bench slopes and create more natural contours. The surface of the heap will result in a minimum of 1 percent grade and the side slopes of the heap will be reduced to a maximum 3:1 grade. After heap grading is completed, it will be covered with a layer of soil, a layer of vegetative material, another layer of soil, and then seeded for vegetative growth. The performance of the cover will be monitored for approximately two years to ensure that discharge from the reclaimed heap will not degrade the water quality of Napias Creek based on Idaho's water quality standards. During this time, the discharge at the toe of the heap will travel through the existing collection ditch to the solution ponds.

After the rinse solution monitoring program indicates compliance with the cover performance criteria, the solution ponds will be reclaimed. This phase includes folding the liners into the pond areas and grading the pond embankments to cover the liners and to provide shallow depressions to facilitate development of wetlands. These wetlands will be fed by the collection ditch that carries the discharge from the toe of the heap and runoff from the heap. The water quality in the wetlands will be monitored to determine potential adverse impacts from the heap discharge after closure. The wetland monitoring program will last for up to three months following wetland construction.

At the completion of the pond reclamation and monitoring, the solution collection ditch will be reclaimed and reconstructed to become an infiltration ditch. The infiltration ditch will provide a more natural transport of seepage emerging from the toe of the heap to pass into the wetland area. It is anticipated that most of the heap seepage will infiltrate, with measurable flow to the wetland occurring only during snowmelt or storm events.

B. Completed Reclamation Activities

Reclamation activities that have occurred thus far include heap rinsing and grading.

C. Current Reclamation Activities

Reclamation activities that will take place during the effective period of the proposed NPDES permit include further rinsing and contouring of the heap, capping and seeding the heap, and construction of the treatment wetlands.

D. Future Reclamation Activities

Future reclamation activities include ensuring adequate vegetation growth for sediment stability and monitoring to determine effectiveness of treatment wetlands.

IV. Roads

A. Reclamation Activities

Haul or access roads abandoned during the operating life of the project or at closure will be reclaimed unless the USFS requests that they remain open. Road surfaces at grade will be ripped to reduce compaction and coversoiled in preparation for seeding. As required by the Idaho Administrative Code (IDAPA 20.03.02), abandoned roads will be cross-ditched as necessary to control erosion. Sections of roads through cuts and fills will be stabilized using construction erosion control features, such as diversion ditches, terraces or water bars, and vegetated with approved plant species. Sediment control structures will be maintained until reclamation efforts are completed and no longer needed. The sediment control structures will then be removed or reclaimed. Surface water-holding features will be broken up or removed and the affected area will be backfilled to grade and stabilized through vegetation.

B. Completed Reclamation Activities

No reclamation activities that have occurred thus far.

C. Current Reclamation Activities

It is not anticipated that these reclamation activities that will take place during the effective period of the proposed NPDES permit.

D. Future Reclamation Activities

Future reclamation activities include appropriate closure procedures unless the USFS requests that the roads remain open.

V. Diversions/Sediment Control Structures

A. Reclamation Activities

Following reclamation of the mine site and facilities, the sediment structures will be decommissioned. Depending upon the post mining land use, the structures may be either cleaned out and removed and the area reclaimed, or left in-place as surface water impoundment for livestock and wildlife use. When the structures are removed, the sediment will be used in reclamation or buried within the waste rock dumps.

Additionally, stream diversion channels or ditches that are no longer necessary will be reclaimed. Channels will be re-established as close as possible to the pre-mining drainage pattern with similar channels, aspects, and longitudinal profiles. Temporary diversions constructed around the waste rock dump will be evaluated to determine whether these diversions should be upgraded to permanent diversions or rerouted along the groin of the dumps. The final drainage channel route will be evaluated to determine channel velocities, erosion potential, necessary vegetation, and other construction elements to ensure the channels are stable and are not contributing sediment to downstream areas.

B. Completed Reclamation Activities

No reclamation activities that have occurred thus far.

C. Current Reclamation Activities

It is not anticipated that these reclamation activities that will take place during the effective period of the proposed NPDES permit.

D. Future Reclamation Activities

Future reclamation activities depends upon the post mining land use. The structures may be either cleaned out and removed and the area reclaimed, or left in-place as surface water impoundment for livestock and wildlife use.

VI. Ancillary Facilities

A. Reclamation Activities

Plant facilities, ancillary facilities, and all equipment on site will be decommissioned and removed or salvaged, if possible. The building foundations will be buried and the building facility site will be graded to establish drainage and fill in depressions. Surfaces will be loosened, covered with soil, and seeded for vegetation. Monitoring wells will be plugged and abandoned according the Idaho State water well requirements.

B. Completed Reclamation Activities

No reclamation activities that have occurred thus far.

C. Current Reclamation Activities

Reclamation activities that will take place during the effective period of the proposed NPDES permit include removal of all buildings and equipment.

D. Future Reclamation Activities

Future reclamation activities include burring building foundations; grading the building facility site; cover the site with soil; and seed for vegetation. Monitoring wells will be plugged and abandoned according the Idaho State water well requirements.

VII. Abandoned Mine Land Reclamation

A. Reclamation Activities

The area of the mine project is located in historic Mackinaw or Leesburg Mining District. This area has been extensively placered and hydraulicly mined leaving behind many acres of unreclaimed placer gravels, diversion ditches and borrow sites. Approximately 18 acres of previously mined land will be reclaimed by MBC. These areas include placers covered by the Wards Gulch waste dump and sedimentation pond, placer gravels in the Wards Gulch and Camp Creek construction laydown areas, placers utilized as an aggregate source along Napias Creek, and placer gravels reclaimed as a result of disposal of excess cut material generated during wetland mitigation at Phelan Creek.

B. Completed Reclamation Activities

These reclamation activities that have been completed.

C. Current Reclamation Activities

No reclamation activities will take place during the effective period of the proposed NPDES permit.

D. Future Reclamation Activities

No future reclamation activities will occur.

APPENDIX C - BEARTRACK MINE WASTE STREAMS

As a supplement to Section III of the Fact Sheet, this appendix describes wastewater management and discharges from the Beartrack Mine. This section includes: a description of each of the waste streams discharged or proposed to be discharged from the facility through Outfall 001 (Section I); and discussions for the removal of existing and previously proposed outfalls (Section II). A map of the discharge location(s) is provided in Appendix A (Figure A-2).

I. Continuance of Permitted Outfall 001

The current NPDES permit authorizes discharge to Napias Creek from Outfall 001 in accordance with specified effluent limitations and monitoring requirements. Outfall 001 is located immediately below the confluence with Arnett Creek. It was constructed and became operational in 1995. The design of Outfall 001 incorporates a multi-port diffuser to maximize initial dilution. Pollutants of concern in Outfall 001 include metals (arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc), weak acid dissociable (WAD) cyanide, ammonia, nitrate, total suspended solids (TSS), and pH.

A. Storm Water

During closure operations, the water management strategy will focus on erosion control and management of mine related waters either through the NPDES system or by transferring storm water to accelerate South Pit filling. Waters discharged through Outfall 001 will be managed through the existing storm water system and will include runoff from both disturbed and reclaimed portions of roads and mine facilities, as well as other various disturbances. Contributing flows are projected to include surface water runoff and springs and seeps from the Wards Gulch waste rock facility and french drain, North Pit, administrative area, crusher-conveyor areas, refinery area, and haulage and service roads.

The storm water treatment plant, used for flocculation of suspended particles, will be utilized to treat storm water prior to discharge through Outfall 001. Depending upon water management needs, the pretreatment system for pit dewatering and for North Pit backfill construction will remain operational, as long as needed, into closure. As mine facilities, roads, and other disturbed areas are reclaimed and become revegetated, use of the storm water treatment plant should begin to decline. It is anticipated that the plant will be dismantled at the end of the closure period.

B. South Pit

The South Pit is not expected to discharge during this permit cycle, however, it is an important component of water management during mine closure. During closure, the South Pit will naturally begin filling to form a lake as documented in the FEIS (USFS, 1991). The mine is the routing project surface water into the South Pit to accelerate filling. The mine began use of this option in Spring of 2001 based on a hydrochemical model of the South Pit (Shepherd Miller, Inc., 2000) that predicted accelerated filling reduced the length of time that mineralized rock in the pit shell is exposed to oxygen results in predictions of pit water chemistry that have substantially improved water quality. The model estimated that it would take five years to fill the pit using the accelerated filling scenario.

C. Heap Leach Pad

Several options are being considered for managing neutralized water from the leach pad. These options include: containing all neutralized water within the facility, transferring neutralized water to accelerate South Pit filling, enhanced evaporation, treatment and discharge, and land application. Since it may prove most feasible to manage neutralized water during closure through a combination of management activities, the mine has requested that the re-issued permit allow for the discharge of neutralized water from the leach pad through Outfall 001.

Heap leach operations for extracting gold and silver included the application of dilute sodium cyanide solutions to the ore. Thererfore, the chemistry of the neutralized solution removed from the leach pad during closure may include low concentrations of WAD cyanide and nitrogenous products resulting from cyanide degradation (e.g., nitrate and ammonia).

II. Removal of Existing and Proposed Outfalls

A. Outfall 002

In the 1996 renewal application, MBC proposed to discharge through Outfall 002 to Smith Gulch, which is a tributary to Napias Creek. Outfall 002 was intended to discharge storm water and snow melt runoff, Ward’s Gulch By-pass, and water from various springs and seeps. However, the permittee never discharged from this outfall. Since 1996, the water management strategy for the Beartrack mine has been modified to reflect closure operations; therefore, Outfall 002 will not be required and MBC has modified their application (MBC, 2000) to remove this proposed outfall from the renewal application.

B. Outfall 003

The existing NPDES permit authorizes discharge from Outfall 003 to an unnamed tributary (ephemeral drainage) of Napias Creek. This outfall was constructed in 1995 to discharge water from natural springs and seeps beneath the lined heap leach pad. In 1997, MBC observed an intermittent trickle from Outfall 003 and collected samples. During a subsequent field inspection, EPA staff indicated that the observed conditions at Outfall 003 did not constitute a discharge to waters of the U.S. During more recent discussions between MBC and EPA, EPA staff have indicated that the discharge from this outfall to waters of the U.S. is not likely to occur because the construction of the mine, specifically the heap leach pad, altered the pre-existing terrain that provided drainage to the unnamed tributary of Napias Creek. Since there is no water flow in the unnamed tributary, there is no way for the discharge to reach Napias Creek. Therefore, EPA recommended that MBC remove Outfall 003 from their permit application. MBC has since modified their permit application (MBC, 2000) to remove this outfall from the renewal application. In the event that water from beneath the leach pad needs to be collected and discharged, it will be done so through Outfall 001.

C. Outfall 003B

In the 1996 renewal application, MBC proposed to discharge through Outfall 003B to an unnamed gulch that is a tributary to Napias Creek. Outfall 003B was intended to discharge water from various springs and seeps. Since 1996, the water management strategy for the Beartrack mine has been modified to reflect closure operations; therefore, Outfall 003B will not be required and MBC has modified their application (MBC, 2000) to remove this proposed outfall from the renewal application.

D. Outfall 004

The existing NPDES permit authorizes discharge from Outfall 004 to an unnamed tributary (ephemeral drainage) of Napias Creek. This outfall was intended to discharge water from natural springs and seeps beneath the lined heap leach pad. However, this outfall was not ever constructed because the portion of the heap leach pad that corresponded to this outfall was never built. MBC has since modified their permit application (MBC, 2000) to remove this outfall from the renewal application.

APPENDIX D - DEVELOPMENT OF EFFLUENT LIMITATIONS

This appendix discusses the basis for and the development of the proposed effluent limits in the draft permit. This section includes: an overall discussion of the statutory and regulatory basis for development of effluent limitations (Section I); discussions of the development of technology-based effluent limits (Section II) and water quality-based effluent limits (Section III); an evaluation of whole effluent toxicity (WET) (Section IV); and a summary of the effluent limits proposed for this draft permit (Section V).

I. Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates the discharges with respect to these sections of the CWA and the relevant National Pollutant Discharge Elimination System (NPDES) regulations under 40 CFR Part 122 to determine which conditions to include in the draft permit.

In general, the EPA first determines the necessary effluent limits based on the technology available to treat the effluent (i.e., technology-based limits). EPA then evaluates the effluent quality expected to result from the treatment technology to determine whether effluent limits are necessary to protect the designated uses of the receiving water (i.e., water quality-based limits). The proposed permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent.

II. Technology-based Evaluation

A. Overview.

There are two general approaches for developing technology-based effluent limits for industrial facilities: (1) using national effluent limitations guidelines (ELGs) and (2) using Best Professional Judgment (BPJ) on a case-by-case basis. The intent of a technology-based effluent limitation is to require a minimum level of treatment for industrial point sources based on currently available treatment technologies while allowing the discharger to use any available control technique to meet the limitations.

The national ELGs are developed based on the demonstrated performance of a reasonable level of treatment that is within the economic means of specific categories of industrial facilities. Where national ELGs have not been developed or did not consider specific pollutant parameters in discharges, the same performance-based approach is applied to a specific industrial facility based on the permit writer’s BPJ. In some cases, technology-based effluent limits based on ELGs and BPJ may be included in a single permit.

B. National Effluent Limitation Guidelines.

Section 301(b) of the CWA requires technology-based controls on effluents. This section of the CWA requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants by March 31, 1989. In no case may BCT or BAT be less stringent than "best practical control technology currently achievable" (BPT), which is the minimum level of control required by section 301(b)(1)(A) of the CWA.

In addition to BPT and BAT requirements, section 306 of the CWA established more restrictive requirements for "new sources." The intent of this special set of guidelines is to set limitations that represent state-of-the-art treatment technology for new sources because these dischargers have the opportunity to install the latest in treatment technology at the time of start-up. These standards, identified as new source performance standards (NSPS), are described as the best available demonstrated control technology (BADT), processes, operating methods, or other alternatives including, where practicable, standards permitting no discharge of pollutants. NSPSs are effective on the date of the commencement of a new facility's operation and the facility must demonstrate compliance within 90 days (40 CFR 122.29(d)).

For several specific industrial sectors, EPA has developed effluent limitation guidelines (ELGs) that contain BPT, BCT, BAT, and NSPS limitations. On December 3, 1982, EPA published effluent guidelines for the mining industry. These guidelines are found in 40 CFR Part 440. Effluent guidelines applicable to gold mines, such as the Beartrack Mine, are found in the Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory (Subpart J) of Part 440. The BADT(40 CFR 440.104) effluent limitation guidelines that apply to gold mine discharges are shown in Table D-1. However, these effluent limitations only apply to a mine with an "active mining area" as defined in 40 CFR 440.132(a). Since the Beartrack Mine no longer meets the definition of an active mining area, these effluent limitations do not apply to their discharge.

Nevertheless, EPA is applying these effluent limitations as Region 10's best professional judgement (BPJ) determination of Best Practicable Control Technology Currently Available (BPT) controls for this discharge.

BPT is based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the industrial category or subcategory. BPJ-based effluent limits are technology-based limits derived on a case-by-case basis under Section 402(a)(1) of the Clean Water Act. BPJ limits are established in cases where ELGs are not available for, or do not regulate, a particular pollutant of concern. EPA has developed this BPJ effluent limitation in accordance with federal regulations 40 CFR 125.3.

Table D-1: Technology-Based Effluent Limitations Applicable to MBC Discharge

Effluent Characteristic	Effluent Limitations[1]	
	daily maximum	monthly average
cadmium, ug/l	100	50
copper, ug/l	300	150
lead, ug/l	600	300
mercury, ug/l	2	1
zinc, ug/l	1,500	750
TSS, mg/l	30	20
pH, su	within the range 6.0 -9.0	

Footnotes:
1. Effluent limitations for metals are expressed as total recoverable metal.

III. Water Quality-based Evaluation

A. Overview

In addition to the technology-based limits discussed above, EPA evaluated the MBC's discharges to determine compliance with Section 301(b)(1)(C) of the CWA. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations at 40 CFR 122.44(d) implement section 301(b)(1)(C) of the CWA. These regulations require that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA follows guidance in the *Technical Support Document for Water Quality-based Toxics Control* (TSD; EPA, 1991). The water quality-based analysis consists of four steps:

1. Determine the appropriate water quality criteria (Section III.B);
2. Determine if there is "reasonable potential" for the discharge to exceed the criteria in the receiving water (Section III.C.);
3. If there is "reasonable potential", develop a WLA (see Section III.D.1); and
4. Develop effluent limitations based on the WLA (see Section III.D.2).

The following sections provide a detailed discussion of each step.

B. Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. For Idaho, the State water quality standards are found at IDAPA 58, Title 1, Chapter 2 (IDAPA 58.01.02). The applicable criteria are determined based on the beneficial uses of the receiving water. As discussed in Section IV of this fact sheet, the beneficial uses for the receiving waters of the Beartrack Mine discharge are as follows:

> *Napias Creek (outfall 001) - cold water biota, salmonid spawning, and secondary contact recreation (IDAPA 58.01.02.101.01.a), agricultural and industrial water supply (IDAPA 58.01.02.100.03), wildlife habitats (IDAPA 58.01.02.100.04), and aesthetics (IDAPA 58.01.02.100.05).*

For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses. The applicable criteria based on the above uses are summarized in Tables D-2 through D-4.

Idaho's aquatic life criteria for several of the metals of concern are calculated as a function of hardness measured in mg/l of calcium carbonate ($CaCO_3$). The hardness-based water quality criterion equations are provided in Table D-3. As the hardness of the receiving water increases, the toxicity of these metals decreases and the numerical value of the criteria increases.

The Idaho water quality standards (IDAPA 58.01.02.210.01) incorporates the toxic criteria set forth in 40 CFR 131.36(b)(1) (National Toxics Rule), as of July 1, 1993, which specifies a hardness range of 25-400 mg/L. Therefore, the hardness generally used to calculate the criteria is the hardness in the receiving water after mixing with the effluent (i.e., downstream hardness). For Outfall 001, the fifth percentile of actual hardness measurements downstream of the outfall were 6 mg/L during low flow and 4 mg/L during high flow. Since the measured hardness falls below the low end cap for the criteria, a hardness of 25 mg/L was used to develop these criteria.

In addition to the calculation for hardness, Idaho's criteria for some metals include a "conversion factor" to convert from total recoverable to dissolved criteria. Conversion factors address the relationship between the total amount of metal in the water column (i.e., total recoverable metal) and the fraction of that metal that causes toxicity (i.e., bioavailable metal or dissolved fraction). Conversion factors for the dissolved criteria are shown in Table D-3.

The Idaho water quality standards have differing temperature requirements that apply to Napias Creek. For the designated use of cold water aquatic life, water temperatures are to exhibit 22°C or less with a maximum daily discharge of no greater than 19°C at all times. However, for the designated use of salmonid spawning, water temperatures are to exhibit 13°C or less with a maximum daily average no greater than 9°C. Salmonid spawning periods are as follows: August 1 through April 1 for chinook salmon (spring), August 15 through June 15 for chinook salmon (summer), October 1 through June 1 for sockeye salmon, and February 1 through July 15 for Steelhead. Additionally, the designated use of bull trout requires water temperatures to exhibit an average daily maximum temperature of 10°C over a 7-day period from June through September.

Table D-2: Water Quality Criteria Applicable to Napias Creek[1]

Parameter, (:g/L, unless otherwise noted)	Cold Water Biota - Aquatic Life Criteria[2]				Human Health Criteria	Agriculture Water Supply Criteria	
	Acute Criteria		Chronic Criteria		Secondary Contact Recreation Criteria (consumption of organisms)[3]	Livestock Watering	Irrigation
	low flow[4]	high flow[5]	low flow[4]	high flow[5]			
Ammonia[6] (mg/L)	11	6.0	2.2	1.9	NA	NA	NA
Arsenic	360		190		50	200	100
Cadmium	0.82		0.37		NA	50	10
Chromium III	180		57		NA	1,000	100
Chromium VI	16		11		NA	1,000	100
Copper	4.6		3.5		NA	500	200
Iron	NA		NA		NA	NA	5,000
Lead	14		0.54		NA	100	5,000
Manganese	NA		NA		NA	NA	200
Mercury	2.1		0.012		0.15	10	NA
Nitrate	surface waters shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths that impair designated beneficial uses						
Nickel	440		49		4600	NA	200
pH (s.u.)	within the range of 6.5 - 9.5				NA	NA	NA
Selenium	20		5		NA	50	20
Silver	0.32		NA		NA	NA	NA

Table D-2: Water Quality Criteria Applicable to Napias Creek[1]							
Parameter, (:g/L, unless otherwise noted)	Cold Water Biota - Aquatic Life Criteria[2]				Human Health Criteria	Agriculture Water Supply Criteria	
	Acute Criteria		Chronic Criteria		Secondary Contact Recreation Criteria (consumption of organisms)[3]	Livestock Watering	Irrigation
	low flow[4]	high flow[5]	low flow[4]	high flow[5]			
Temperature (°C)	9		13		NA	NA	NA
Turbidity (NTU)	below mixing zone, shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 days				NA	NA	NA
WAD Cyanide	22		5.2		220,000	NA	NA
WET (TU)	surface waters shall be free from toxic substances in concentrations that impair designated beneficial uses[7]						
Zinc	35		32		NA	25,000	2,000

Footnotes:

1. Per IDAPA 58.01.02.252.02, water quality criteria for agricultural and industrial water supplies, wildlife habitat, and aesthetics will generally be satisfied by the water quality criteria set forth in Section 200 of the Idaho water quality standards (surface waters shall be free from toxic substances in concentrations that impair designated beneficial uses).
2. The aquatic life criteria are based on IDAPA 58.01.02.210. This section cites the National Toxics Rule (NTR), 40 CFR 131.36(b)(1), and the NTR subparts for toxics (metals and cyanide). The aquatic life criteria for arsenic, cadmium, chromium, copper, lead, mercury (acute only), nickel, silver, and zinc are expressed as the dissolved fraction of the metal. The aquatic life criteria for cadmium, chromium III, copper, lead, nickel, silver, and zinc are calculated as a function of hardness per the equations shown in Table D-3. The hardness value used in the criteria equations was 25 mg/L.
3. The recreation criteria are based on IDAPA 58.01.02.210.01.b, which cites the NTR (except for arsenic which is specified as 50 ug/l in the Idaho standards).
4. The low flow period is July 1 through April 30.
5. The high flow period is May 1 through June 30.
6. The ammonia criteria was based on temperature and pH, which were derived from the criteria for temperature and the 95th percentile of instream pH data. The temperature and pH values used to determine the appropriate criteria are provided in Table D-4
7. EPA's recommended magnitudes for this narrative criterion are 1 TU_c and 0.3 TU_a for the chronic and acute criteria, respectively (TSD 1991). TU means toxicity units, where TU_c is equal to the reciprocal of the effluent concentration that causes no observable effect in a chronic toxicity test and TU_a is the reciprocal of the effluent concentration that causes 50% mortality in an acute toxicity test.

Table D-3: Hardness-Based Water Quality Criteria Equations			
Parameter		dissolved criterion = conversion factor x total criterion (H = hardness)	
		conversion factor	total criterion
Cadmium	acute	1.136672 - [0.041838·ln(H)]	exp [1.128·ln(H) - 3.828]
	chronic	1.101672 - [0.041838·ln(H)]	exp [0.7852·ln(H) - 3.490]
Chromium III	acute	0.316	exp [0.818·ln(H) + 3.688]
	chronic	0.86	exp [0.818·ln(H) + 1.561]
Copper	acute	0.960	exp [0.9422·ln(H) - 1.464]
	chronic	0.960	exp [0.8545·ln(H) -1.465]
Lead	acute	1.46203 - [0.145712·ln(H)]	exp [1.273·ln(H) - 1.460]
	chronic	1.46203 - [0.145712·ln(H)]	exp [1.273·ln(H) - 4.705]
Nickel	acute	0.998	exp [0.846·ln(H) + 3.3612]
	chronic	0.997	exp [0.846·ln(H) + 1.1645]
Silver	acute	0.85	exp [1.72·ln(H) - 6.52]
Zinc	acute	0.978	exp [0.8473·ln(H) + 0.8604]
	chronic	0.986	exp [0.8473·ln(H) + 0.7614]

Table D- 4: Temperature and pH Values for Ammonia Water Quality Criteria in Napias Creek				
Parameter	Acute Criterion		Chronic Criterion	
	low flow[1]	high flow[2]	low flow	high flow
Temperature (°C)[3]	9	9	13	13
pH (s.u.)	7.6	8.0	7.5	7.8

Footnotes:
1. The low flow period is July 1 through April 30.
2. The high flow period is May 1 through June 30.
3. The temperature is based on the criteria for salmonid spawning.

C. Reasonable Potential Evaluation

1. Procedure for Determination of Reasonable Potential

To determine if there is “reasonable potential” to cause or contribute to an exceedence of water quality criteria for a given pollutant (and therefore whether a water quality-based effluent limit is needed), for each pollutant present in a discharge, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is "reasonable potential", and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD to conduct this "reasonable potential" analysis. This section discusses how reasonable potential is evaluated.

The maximum projected receiving water concentration is determined using the following mass balance equation.

$$C_d \times Q_d = (C_e \times Q_e) + (C_u \times Q_u) \qquad \text{(Equation 1)}$$

where,

- C_d = receiving water concentration downstream of the effluent discharge (concentration at the edge of the mixing zone)
- C_e = maximum projected effluent concentration
- C_u = receiving water upstream concentration
- Q_e = effluent flow
- Q_u = receiving water upstream flow
- Q_d = receiving water flow downstream of the effluent discharge = $(Q_e + Q_u)$

If a mixing zone is allowed and solving for C_d, the mass balance equation becomes :

$$C_d = \frac{[C_e Q_e + C_u (Q_u @ MZ)]}{[Q_e + (Q_u @ MZ)]} \qquad \text{(Equation 2)}$$

where, MZ is the fraction of dilution in the mixing zone based on receiving water flow.

Where no mixing zone is allowed,

$$C_d = C_e. \qquad \text{(Equation 3)}$$

By regulation (40 CFR 122.45(c)), the permit limit, in most instances, must be expressed as total recoverable metal. Because chemical differences between the discharged effluent and the receiving water are expected to result in changes in the partitioning between dissolved and adsorbed forms of metal, an additional calculation using what is called a translator is required.

Translators can either be site-specific numbers or default numbers. EPA guidance related to the use of translators in NPDES permits is found in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, June 1996). In the absence of site-specific translators, this guidance recommends the use of the water quality criteria conversion factors (Table D-3) as the default translators. However, MBC has conducted a study to develop site-specific translator values for Napias Creek. This study provided empirically derived translators for arsenic, copper, iron, lead, manganese, nickel, and zinc. The values for the site-specific translators are provided in Table D-5.

Table D-5: Site-Specific Translator Values for Napias Creek Below the Beartrack Mine's Outfall 001

Parameter	Site-Specific Translator Value	
	Acute	Chronic
Arsenic	0.67	0.67
Copper	0.77	0.77
Lead	0.28	0.28
Nickel	0.77	0.77
Zinc	0.83	0.83

Because site-specific translators were not derived for all parameters of concern, the conversion factors for cadmium, chromium, and silver were used as default translators in the reasonable potential and permit calculations for the TCMC discharges. The values for these default translators are provided in Table D-6.

Table D-6: Default Translator Values for Napias Creek Below the Beartrack Mine's Outfall 001		
Parameter	Default Translator Value[1]	
	Acute	Chronic
Cadmium	1.00	0.97
Chromium III	0.316	0.86
Mercury	0.85	NA
Silver	0.85	NA

Footnotes:
1. These values, except mercury, are based on the conversion factors in Table D-3 using a hardness of 25 mg/L.

Therefore, for those metals with criteria expressed as dissolved, Equations 2 and 3 become:

where a mixing zone is allowed:

$$C_d = \frac{[(C_e \times \text{translator})\ Q_e + C_u\ (Q_u \times MZ)]}{[Q_e + (Q_u \times MZ)]}, \qquad \text{(Equation 4)}$$

and where no mixing zone is allowed:

$$C_d = C_e \times \text{translator}. \qquad \text{(Equation 5)}$$

After C_d is determined, it is compared to the applicable water quality criterion. If it is greater than the criterion, a water quality-based effluent limit is developed for that parameter. The following discusses each of the factors used in the mass balance equation to calculate C_d.

2. Maximum Projected Effluent Concentration (C_e)

For parameters with technology-based effluent limits (cadmium, copper, lead, mercury, and zinc), the daily maximum limit was used as the maximum projected receiving water concentration (C_e). The technology-based effluent limit is used in this manner because water quality-based effluent limits are only required when the discharge at the technology-based limit has the reasonable potential to violate water quality standards. The TSD procedure was used for all other parameters.

Per the TSD, the maximum projected effluent concentration in the mass balance equation is represented by the 99th percentile of the effluent data. The 99th percentile is calculated using the statistical approach recommended in the TSD:

C_e = MEC x RPM (Equation 6)

where,

MEC = maximum measured effluent concentration
RPM = reasonable potential multiplier.

The RPM accounts for uncertainty in the effluent data. The RPM depends upon the amount of effluent data and variability of the data as measured by the coefficient of variation (CV) of the data. The RPM decreases as the number of data points increases and the variability (CV) of the data decreases. When there are not enough data to reliably determine a CV (less than 10 data points), the TSD recommends using 0.6 as a default value. Once the CV of the data is determined, the RPM is determined using the statistical methodology discussed in Section 3.3 of the TSD. If all the data was below detect, EPA assumed a RPM of 1.0.

The effluent statistics used in the reasonable potential calculations were based on data collected by MBC (DMR data and other monitoring) and EPA (compliance inspection data) from 1997 through 2000. Only these four years of data were used since it was determined to be most representative of current and future conditions. A summary of the data statistics used in the reasonable potential analysis is provided in Tables D-7 and D-8.

Table D-7: Summary of Effluent Statistics used to Determine Reasonable Potential													
Parameter	Units	Standard Deviation (s)		Mean (:)		Coefficient of Variation (CV)		Popular Variance $(F^2)=\ln(CV^2+1)$		Standard Deviation (F)		# Data Points (n)	
		low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]
Ammonia[3]	mg/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	0	0
Arsenic	:g/l	36.3	62.2	89.0	98.1	0.4	0.6	0.15	0.31	0.39	0.55	78	27
Cadmium[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	78	27
Chromium[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	76	27
Copper[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	78	26
Cyanide (WAD)[3]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	0	0
Iron	:g/l	575	1,342	914	1,370	0.6	1.0	0.33	0.67	0.58	0.82	76	27
Lead[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	79	27
Manganese	:g/l	89	210	241	508	0.4	0.4	0.13	0.16	0.36	0.40	76	26
Mercury[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	85	28
Nickel[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.39	0.53	78	27
Selenium[3]	ug/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	0	1
Silver[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.34	0.34	78	27
Zinc[4]	:g/l	---	---	---	---	0.6	0.6	0.31	0.31	0.55	0.55	76	27

Footnote:
1. The low flow period is July 1 through April 30.
2. The high flow period is May 1 through June 30.
3. There was little or no data for these parameters, however, reasonable potential was established based on the permit application. The applicant has requested that the permit allow the discharge of heap leach rinsate, which was not authorized under the previous permit. A CV of 0.6 is assumed for the purposes of statistical analysis.
4. Most or all the data points for this pollutant were below detection using the analytical method specified in the previous permit, therefore, a CV of 0.6 is assumed for the purposes of statistical analysis.

Table D-8: Summary of Effluent Statistics used to Determine Reasonable Potential cont.											
Parameter	Units	Percentile $p(n)=(1-0.99)^{(1/n)}$		z-score (z)		RPM $RPM=exp[2.326F-0.5F^2]/[exp[zF-0.5F^2]$		MEC		Ce (RPM) x (MEC)	
		low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]	low flow[1]	high flow[2]
Ammonia[3]	mg/l	---	---	---	---	---	---	---	---	---	---
Arsenic	: g/l	0.9427	0.8432	1.578	1.008	1.3	2.1	200	200	270	430
Cadmium[4]	: g/l	0.9427	0.8432	1.578	1.008	1.0	1.0	5	5	100[5]	100[5]
Chromium[4]	: g/l	0.9427	0.8432	1.578	1.008	1.5	2.1	20	20	30	42
Copper[4]	: g/l	0.9427	0.8377	1.578	0.985	1.0	1.0	10	30	300[5]	300[5]
Cyanide (WAD)[3]	: g/l	---	---	---	---	---	---	---	---	---	---
Iron	: g/l	0.9412	0.8432	1.565	1.008	1.6	2.9	2,300	3,670	3,570	10,800
Lead[4]	: g/l	0.9434	0.8432	1.584	1.008	1.5	2.1	20	20	600[5]	600[5]
Manganese	: g/l	0.9412	0.8377	1.565	0.985	1.3	1.7	370	780	490	1,300
Mercury[4]	: g/l	0.9412	0.8377	1.619	1.029	1.5	2.1	1.0	0.3	2[5]	2[5]
Nickel[4]	: g/l	0.9427	0.8432	1.578	1.008	1.5	2.1	50	60	80	130
Selenium[3]	ug/l	---	---	---	---	---	1.0	---	6.3	---	6.3
Silver[4]	: g/l	0.9427	0.8432	1.578	1.008	1.5	2.1	10	10	15	21
Zinc[4]	: g/l	0.9412	0.8432	1.565	1.008	1.5	2.0	410	120	1,500[5]	1,500[5]

Table D-8: Summary of Effluent Statistics used to Determine Reasonable Potential cont.
Footnote: 1. The low flow period is July 1 through April 30. 2. The high flow period is May 1 through June 30. 3. There was little or no data for these parameters, however, reasonable potential was established based on the permit application. The applicant has requested that the permit allow the discharge of heap leach rinsate, which was not authorized under the previous permit. A CV of 0.6 is assumed for the purposes of statistical analysis. 4. Most or all the data points for this pollutant were below detection using the analytical method specified in the previous permit, therefore, a CV of 0.6 is assumed for the purposes of statistical analysis. 5. Technology-based limit from Table D-1.

3. Upstream Receiving Water Concentration (C_u)

The upstream receiving water concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge point. Where sufficient data exists, the 95th percentile of the receiving water data is generally used as an estimate of worst-case.

MBC has been monitoring the receiving waters since the beginning of mine operations. EPA used the receiving water data collected by MBC at Station WQ-22 from 1997 through 2000 to calculate C_u. Two difficulties were encountered in evaluating the receiving water data. First, much of the data was reported as non-detect and in some cases the detection limits exceeded the water quality criteria. Second, much of the non-detect data had more than one detection level. Therefore, EPA made the following assumptions:

- where all or most of the data were non-detect (<10 detected values), zero was assumed; and
- where all or most of the data were detected (>10 detected values), the 95th percentile of the detected values was assumed.

The upstream receiving water concentrations (C_u) derived for each parameter are identified in Table D-9 (see Figure A-3 for monitoring station location).

Table D-9: Upstream Concentrations (C_u) used to Determine Reasonable Potential					
Parameter	Units	Dissolved Concentration		Total Concentration	
		low flow	high flow	low flow	high flow
Ammonia	mg/l	---	---	0.14	0.35
Arsenic	:g/l	0	0	0	0
Cadmium	:g/l	0	0	0	0
Chromium	:g/l	0	0	0	0
Copper	:g/l	0	0	0	0
Cyanide (WAD)	:g/l	0	0	---	---
Iron	:g/l	---	---	3,520	1,310
Lead	:g/l	0	0	0	0
Manganese	:g/l	---	---	70	20
Mercury	:g/l	0	0	0	0
Nickel	:g/l	20	10	30	5
Selenium	ug/l	---	---	0	0
Silver	:g/l	0	0	---	---
Turbidity	NTU	---	---	59	17
Zinc	:g/l	0	0	0	0

4. Upstream Flow (Q_u)

The upstream flow used in the mass balance equation depends upon the criterion that is being evaluated. In accordance with the applicable federal and state regulations and the TSD guidance, the critical low flows used to evaluate compliance with the water quality criteria are:

- The 1-day, 10-year low flow (1Q10) is used for the protection of aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.
- The 7-day, 10-year low flow (7Q10) is used for protection of aquatic life from chronic effects. It represents the lowest 7-day average flow expected to occur once in 10 years.

- The 30-day, 5-year low flow (30Q5) is used for the protection of human health and agricultural uses from non-carcinogens. It represents the 30-day average flow expected to occur once in 5 years.
- The harmonic mean flow is a long-term average flow and is used for the protection of human health and agricultural uses from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.

Data collected from United States Geological Survey (USGS) station on Napias Creek were used to estimate the critical low flows applicable to outfall 001. The USGS has been monitoring the daily flow of Napias Creek at Station No. 13306385 since August 1991. The USGS has made these data available through September 2000, which equates to just over nine years of daily flow data.

The location of the Napias Creek USGS station is approximately ten feet below Outfall 001 and 30 feet below the confluence of Napias Creek and Arnett Creek. Since the gaging station flow is below the outfall, the data must be corrected to provide the upstream flow by subtracting out the effluent flow rate. EPA was only able to do this from 1996 through 1999 because these were the only years that EPA had daily effluent flow values. This does not provide an adequate amount of flow data to calculate the 1Q10 and 7Q10 low flows, which require a minimum of ten years of daily records. To remedy this, given that there are 4 years of corrected upstream flow data, the minimum low flow value, and the minimum low flow value for the seven-day running average, will be substituted for the 1Q10 and the 7Q10 low flows, respectively. However, these flows will continue to be referred to in this fact sheet as the 1Q10 and 7Q10 low flows to eliminate confusion.

Napias Creek flows vary dramatically with precipitation and snow melt, with peak flows occurring from May through June. Therefore, the reasonable potential analysis for these outfalls was conducted for both the high and low flow conditions and two sets of effluent limits were developed for Outfall 001 which corresponded to both flow conditions. Flows representative of critical flow conditions are provided in Table D-10. Since effluent limitations are based on a monthly basis, the low flow period values in Table D-10 are from

July 1 through April 30 and the high flow period values in Table D-10 are from May 1 through June 30 even though the true high flow period extends into the month of July.

Table D-10: Upstream Receiving Water Flow Data for Napias Creek (1996 - 1999)		
Critical Low Flow	Flow Values	
	low flow (July 1 - April 30)	high flow (May 1 - June 30)
1Q10, mgd	3.05	12.39
7Q10, mgd	4.01	13.74
30Q5, mgd	4.66	43.88
harmonic mean, mgd	6.65	53.55

5. Mixing Zone (MZ)

Mixing zones are defined as a limited area or volume of water where the discharge plume is progressively diluted by the receiving water. Water quality criteria may be exceeded in the mixing zone as long as acutely toxic conditions are prevented from occurring and the applicable existing designated uses of the water body are not impaired as a result of the mixing zone. Mixing zones are allowed at the discretion of the State, based on the State water quality standards regulations.

The Idaho water quality standards at IDAPA 58.01.02.060 allow for the use of mixing zones after a biological, chemical, and physical appraisal of the receiving water and the discharge. The standards allow water quality within a mixing zone to exceed chronic water quality criteria so long as chronic water quality criteria are met at the boundary of the mixing zone. Acute water quality criteria may be exceeded within a zone of initial dilution inside the chronic mixing zone.

In accordance with state water quality standards, only IDEQ may authorize mixing zones. As discussed in Section VIII.D of the Fact Sheet, IDEQ has not prepared a preliminary CWA Section 401 Certification authorizing mixing zones for the Beartrack Mine discharges. The mixing zone volumes that may be authorized by IDEQ are shown in Table D-11. More information on the mixing zones (including the biological, chemical, and physical appraisal) will be available in IDEQ's final certification.

If IDEQ authorizes a different size mixing zone in its final 401 certification, EPA will recalculate the reasonable potential and effluent limits based on the final mixing zones. If the State does not authorize a mixing zone in its 401 certification, EPA will recalculate the limits based on meeting water quality criteria at the point of discharge (i.e., “end-of-pipe” limits).

Table D-11: Mixing Zone Dilutions for Outfall 001 (expressed as percent of receiving water flow)

Parameter	Aquatic Life		Human Health/Agriculture[1]	
	low flow	high flow	low flow	high flow
Ammonia	25	25	---	---
Arsenic	0[2]	25	25	25
Cadmium	25	25	75	25
Chromium	0[2]	0[2]	0[2]	0[2]
Copper	25	25	25	25
Cyanide, WAD	25	25	0[2]	0[2]
Iron	---	---	0[2]	25
Lead	25	25	50	25
Manganese	---	---	25	25
Mercury	25	25	100	25
Nickel	25	25	0[2]	0[2]
Selenium	25	25	100	100
Silver	25	---	---	---
Zinc	25	25	0[2]	0[2]

Footnote:
1. The Idaho standards are silent regarding mixing zones for human health criteria. EPA used up to 100% of the receiving water for dilution for human health criteria, since the mixing zone size limitation for aquatic life is to account for fish passage.
2. A mixing zone was not necessary for this parameter because reasonable potential was not determined when no dilution was used in the calculations.

6. Effluent Flow (Q_e)

The effluent flow used in the mass balance equation is the maximum effluent flow. Because the receiving water exhibits dramatic seasonal variations, separate effluent flows were determined for both high and low receiving water flows to allow accurate analysis of receiving water effects. Additionally, MBC is diverting flow that would normally discharge through Outfall 001 to the South Pit to accelerate filling during closure. MBC estimates that approximately 72 million gallons per year will be diverted to the South Pit. Therefore, MBC has stated that the maximum effluent flow for the low flow period (July 1 through April 30) and the high flow period (May 1 through June 30) are 0.471 cfs (0.30 mgd) and 1.62 cfs (1.05 mgd), respectively.

7. Reasonable Potential Analysis Results

Results of the reasonable potential analysis for each parameter is provided in Tables D-12 and D-13. Based on the reasonable potential analysis, water quality-based effluent limits were developed for the following parameters: arsenic, ammonia, cadmium, copper, cyanide (WAD), lead, mercury, selenium, silver, and zinc.

Table D-12: Results of Reasonable Potential Analysis for Aquatic Life								
Parameter	Units	Projected Downstream Concentration (C_d)				Reasonable Potential (y/n)		Notes
		acute		chronic				
		low flow	high flow	low flow	high flow	low flow	high flow	
Ammonia	mg/L	N/A	N/A	N/A	N/A	y	y	RP determined because cyanide from heap rinsate in discharge will increase ammonia concentration
Arsenic	ug/L	179	70	179	65	n	n	
Cadmium	ug/L	28	25	22	23	y	y	
Chromium	ug/L	9.6	13	26	36	n	n	
Copper	ug/L	65	58	53	54	y	y	
Cyanide (WAD)	ug/L	N/A	N/A	N/A	N/A	y	y	RP determined because of potential discharge from heap during shutdown operations
Iron	ug/L	---	---	---	---	n	n	
Lead	ug/L	47	43	39	39	y	y	
Manganese	ug/L	---	---	---	---	n	n	
Mercury	ug/L	0.5	0.22	0.46	0.23	y	y	
Nickel	ug/L	16	24	13	22	n	n	
Selenium	ug/L	N/A	N/A	N/A	N/A	y	y	RP determined because of potential discharge from heap during shutdown operations
Silver	ug/L	3.6	4.5	---	---	y	y	
Turbidity	NTU	0.4	0.5	0.4	0.5	n	n	net increase less than 50 NTU for acute and 25 NTU for chronic
Zinc	ug/L	352	315	287	292	y	y	

— means no criterion
N/A means not able to determine C_d using Equations 4 or 5.

Table D-13: Results of Reasonable Potential Analysis for Human Health and Agriculture

Parameter	Units	Projected Downstream Concentration (C_d) Human Health Agriculture		Reasonable Potential (y/n)		Notes
		low flow	high flow	low flow	high flow	
Ammonia	mg/L	---	---	n	n	
Arsenic	ug/L	41	30	n	n	
Cadmium	ug/L	8	9	n	n	
Chromium	ug/L	30	42	n	n	
Copper	ug/L	61	26	n	n	
Cyanide (WAD)	ug/L	N/A	N/A	n	n	
Iron	ug/L	3,600	2,100	n	n	
Lead	ug/L	68	52	n	n	
Manganese	ug/L	155	116	n	n	
Mercury	ug/L	0.12	0.09	n	n	
Nickel	ug/L	76	125	n	n	
Selenium	ug/L	N/A	N/A	y	y	RP determined because of potential discharge from heap during shutdown operations
Silver	ug/L	---	---	n	n	
Turbidity	NTU	---	---	n	n	
Zinc	ug/L	1500	1500	n	n	

— means no criterion
N/A means not able to determine C_d using Equations 4 or 5.

D. Derivation of Water Quality-based Effluent Limits

1. Development of Wasteload Allocations (WLAs)

Once EPA has determined that a water quality-based effluent limit is required for a pollutant, the first step in deriving the effluent limit is development of a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs and permit limits are derived based on guidance in the TSD (EPA, 1991). WLAs for this permit were established in two ways: based on a mixing zone (for most metals) and based on meeting water quality criteria at “end-of-pipe” (for pH).

WLAs are calculated for each parameter based on each criterion. Where the state authorizes a mixing zone for the discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentration of the pollutant, and the water quality criterion. It should be noted that there may be different mixing zones for different parameters or even for criterion. WLAs are calculated using the same mass balance equation used in the reasonable potential evaluation (see Equation 1) although, C_d becomes the criterion and C_e the WLA. Making these substitutions, Equation 1 is rearranged to solve for the WLA (or C_e), becoming:

$$WLA = C_e = \frac{[\text{criterion} \cdot (Q_e + (Q_u \cdot MZ)] - [C_u\ (Q_u \cdot MZ)]}{Q_e} \qquad \text{(Equation 7).}$$

The values for C_u, Q_u, MZ, and Q_e are the same as those used in the reasonable potential analysis (see Section III.C). For criteria expressed as dissolved, the translator is added to Equation 7 and the WLA is calculated as:

$$WLA = C_e = \frac{[(\text{criterion} \div \text{translator}) \cdot (Q_e + (Q_u \cdot MZ))] - [C_u\ (Q_u \cdot MZ)]}{Q_e} \quad \text{(Equation 8).}$$

The translator values are provided in Tables D-5 and D-6. Where no mixing zone is allowed, the criterion becomes the WLA (see Equation 9) or the dissolved metal criterion using a translator becomes the WLA (see Equation 10). Establishing the criterion as the WLA ensures that the permittee does not contribute to an exceedence of the criteria.

WLA = criterion (Equation 9)

WLA = criterion ÷ translator (Equation 10)

The WLAs for the parameters that exhibited reasonable potential (see Tables D-12 and D-13 for results of reasonable potential analysis) are provided in Table D-14.

Table D-14: Waste Load Allocations (WLAs) for Outfall 001											
Parameter	Units	Aquatic Life				Human Health		Agriculture			
		acute		chronic		Secondary Contact Recreation		Livestock		Irrigation	
		low flow	high flow	low flow	high flow	low flow	high flow	low flow	high flow	low flow	high flow
Ammonia	mg/L	40	23	9.6	8.1	---	---	---	---	---	---
Cadmium	ug/L	2.9	3.2	1.7	1.6	---	---	---	---	---	---
Copper	ug/L	21	24	20	19	---	---	---	---	---	---
Cyanide (WAD)	ug/L	78	87	23	22	---	---	---	---	---	---
Lead	ug/L	175	196	8.4	8.3	---	---	---	---	---	---
Mercury	ug/L	8.5	9.5	0.052	0.051	---	---	---	---	---	---
Selenium	ug/L	71	79	22	21	---	---	826	2,140	331	856
Silver	ug/L	1.3	1.5	---	---	---	---	---	---	---	---
Zinc	ug/L	151	168	169	166	---	---	---	---	---	---

Since the different criteria (acute aquatic life, chronic aquatic life, human health, agriculture) apply over different time frames and may have different mixing zones, it is not possible to compare the criteria, or the WLAs developed from the criteria, directly to determine which criterion results in the most stringent limits. For comparison between aquatic life criteria, human health criteria, and agricultural criteria, effluent limits must be derived for each, and the most stringent effluent limits applied to the discharge.

Because many criteria for protection of aquatic life have two criteria, acute and chronic, the effluent limits for each requirement yields different effluent treatment requirements that cannot be compared to each other without calculating the long-term average performance level the facility would need to maintain in order to meet each requirement. Therefore, EPA develops effluent limits for aquatic life protection by statistically converting the WLAs to long-term average (LTA) concentrations and using the most stringent LTA to develop effluent limitations for protection of aquatic life. This procedure will allow the facility to design a treatment system for one level of effluent toxicity - the most limiting toxic effect.

2. Calculation of Long-term Average Concentrations (LTAs) for Aquatic Life Criteria

The conversion of a WLA to a LTA is dependent upon the coefficient of variation (CV) of existing effluent data and the selected probability distribution of the effluent. The probability distribution corresponds to the percentile of the estimated effluent concentration. EPA uses a 99th percentile probability distribution for calculating a long-term average, as recommended in the TSD (EPA, 1991). The following equation from Chapter 5 of the TSD is used to calculate the LTA concentrations (alternately, Table 5-1 of the TSD may be used):

$$LTA = WLA \cdot \exp[0.5\sigma^2 - z\sigma] \qquad \text{(Equation 11)}$$

where,

σ^2 = $\ln(CV^2 + 1)$ for acute aquatic life criteria
= $\ln(CV^2/4 + 1)$ for chronic aquatic life criteria

CV = see Table D-7

z = 2.326 for 99th percentile occurrence probability.

The LTAs for the parameters that exhibited reasonable potential are provided in Table D-15. Because silver only has an acute WLA, only the acute LTA was calculated for this parameter.

Table D-15: Long Term Averages (LTAs) for Outfall 001

Parameter	Units	Aquatic Life			
		acute		chronic	
		low flow	high flow	low flow	high flow
Ammonia	mg/L	13	7.5	5.0	4.3
Cadmium	ug/L	9.3	1.0	0.87	0.86
Copper	ug/L	6.8	7.6	10	10
Cyanide (WAD)	ug/L	25	28	12	12
Lead	ug/L	56	63	4.4	4.4
Mercury	ug/L	2.7	3.0	0.027	0.027
Selenium	ug/L	23	25	11	11
Silver	ug/L	0.42	0.47	---	---
Zinc	ug/L	48	58	89	91

3. Calculation of Water Quality-based Effluent Limits

a. Effluent Limits Based on Aquatic Life Criteria

Once the LTA concentration is calculated for each criterion, the most stringent LTA concentration is then used to develop the maximum daily (MDL) and monthly average (AML) permit limits. The MDL is based on the effluent variability (i.e., CV of the data) and the selected probability distribution, while the AML is dependent upon these two variables as well as the monitoring frequency. As recommended in the TSD, EPA used the 95th percentile as the selected probability distribution for the AML calculation and the 99th percentile for the MDL calculation. The MDL and AML are calculated using the following equation from the TSD (alternately, Table 5-2 of the TSD may be used):

$$\text{MDL or AML} = \text{LTA} \cdot \exp[z\sigma - 0.5\sigma^2] \qquad \text{(Equation 12)}$$

for the MDL:

F^2 = $\ln(CV^2 + 1)$

z = 2.326 for the 99th percentile occurrence probability for the AML:

F^2 = ln(CV^2/n + 1)
n = number of sampling events required per month
z = 1.645 for the 95th percentile occurrence probability.

The aquatic life effluent limits for the parameters that exhibited reasonable potential are provided in Table D-16.

Table D-16: Aquatic Life Effluent Limitations for Outfall 001						
Parameter	Units	# samples per month	AML		MDL	
			low flow	high flow	low flow	high flow
Ammonia	mg/L	4	7.8	6.6	16	13
Cadmium	ug/L	4	1.4	1.3	2.7	2.7
Copper	ug/L	4	11	12	21	24
Cyanide (WAD)	ug/L	4	19	18	37	36
Lead	ug/L	4	6.9	6.8	14	14
Mercury	ug/L	4	0.043	0.042	0.086	0.084
Selenium	ug/L	4	18	17	36	35
Silver	ug/L	4	0.66	0.74	1.3	1.5
Zinc	ug/L	4	75	87	151	168

b. Effluent Limits Based on Human Health and Agricultural Criteria

Developing permit limits for pollutants affecting human health agriculture is somewhat different from setting limits for aquatic life because the exposure period is generally longer than one month and the average exposure, rather than the maximum exposure, is usually of concern. Because compliance with permit limits is normally determined on a daily or monthly basis, it is necessary to set human health and agriculture permit limits that meet a given WLA for every month.

If the procedures described previously for aquatic life protection were used for developing permit limits for human health and agriculture, both MDLs and AMLs would exceed the WLA necessary to meet criteria concentrations in the receiving water. Thus, even if a facility was discharging in compliance with permit limits calculated using these procedures, it would be possible to constantly exceed the WLA. In addition, the statistical derivation procedure is not applicable to exposure periods more than 30 days. Therefore, the recommended statistical approach for setting water quality-based limits for human health and agriculture protection is to set the AML equal to the WLA, and then calculate the MDL based on effluent variability and the number of samples per month using the multipliers provided in Table 5-3 of the TSD. These multipliers are the ratio of the MDL to the AML as calculated by the following relationship:

$$\frac{MDL}{AML} = \frac{\exp[z_m F - 0.5F^2]}{\exp[z_a F_n - 0.5F_n^2]} \qquad \text{(Equation 13)}$$

where,

F_n^2	$= \ln(CV^2/n + 1)$
F^2	$= \ln(CV^2 + 1)$
CV	= see Table D-7
n	= number of samples per month
z_m	= 2.326 for the 99th percentile exceedance probability of the MDL
z_a	= 1.645 for the 95th percentile exceedance probability of the AML.

As stated above, EPA used the 95th percentile as the selected probability distribution for the AML and the 99th percentile for the MDL in this calculation.

The human health and agriculture effluent limits for the parameters that exhibited reasonable potential are provided in Table D-17 and D-18, respectively.

Table D-17: Human Health Effluent Limitations for Outfall 001						
Parameter	Units	# samples per month	AML		MDL	
			low flow	high flow	low flow	high flow
Ammonia	ug/L	4	---	---	---	---
Arsenic	ug/L	4	---	---	---	---
Cadmium	ug/L	4	---	---	---	---
Copper	ug/L	4	---	---	---	---
Cyanide (WAD)	ug/L	4	---	---	---	---
Lead	ug/L	4	---	---	---	---
Mercury	ug/L	4	---	---	---	---
Selenium	ug/L	4	---	---	---	---
Silver	ug/L	4	---	---	---	---
Zinc	ug/L	4	---	---	---	---

Table D-18: Agriculture Effluent Limitations for Outfall 001										
Parameter	Units	# samples per month	Livestock				Irrigation			
			AML		MDL		AML		MDL	
			low flow	high flow	low flow	high flow	low flow	high flow	low flow	high flow
Ammonia	mg/L	4	---	---	---	---	---	---	---	---
Cadmium	ug/L	4	---	---	---	---	---	---	---	---
Copper	ug/L	4	---	---	---	---	---	---	---	---
Cyanide (WAD)	ug/L	4	---	---	---	---	---	---	---	---
Lead	ug/L	4	---	---	---	---	---	---	---	---
Mercury	ug/L	4	---	---	---	---	---	---	---	---
Selenium	ug/L	4	830	2,100	1,700	4,300	330	860	660	1,700
Silver	ug/L	4	---	---	---	---	---	---	---	---
Zinc	ug/L	4	---	---	---	---	---	---	---	---

IV. Whole Effluent Toxicity (WET) Evaluation

Whole effluent toxicity (WET) is defined as the aggregate toxic effect of an effluent measured directly by an aquatic toxicity test. WET tests are standardized laboratory tests that measure the total toxic effect of an effluent by exposing organisms to the effluent and noting the effects. There are two different durations of toxicity tests: acute and chronic. Acute toxicity tests measure the test organisms survival over a 96-hour test exposure period. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure.

MBC has conducted limited WET testing on their effluents. The current permit required MBC to perform chronic toxicity tests on effluent collected from outfall 001. In May 1996, chronic WET tests were performed on effluent from outfall 001. Results of these tests indicated no chronic toxicity at the critical effluent level of 3.3% based on 30 to 1 dilution. Chronic toxicity was indicated for the outfall 001 wastewater at 33% effluent, however, this was above the critical effluent level. In May and October of 1998 and June and October of 1999, MBC conducted WET tests on outfall 001 and the receiving water upstream and downstream of the outfall. Chronic toxicity was indicated at 33% effluent for one species tested on Outfall 001 in October 1999.

Federal regulations at 40 CFR 122.44(d)(1) require that permits contain limits on WET when a discharge has reasonable potential to cause or contribute to an exceedence of a water quality standard. In Idaho, the relevant water quality standard states that surface waters of the State shall be free from toxic substances in concentrations that impair designated beneficial uses. In the absence of state numeric criteria for WET, EPA uses 1.0 TUc and 0.3 TUa as the chronic and acute criteria, respectively.

Since there was not an adequate amount of WET data to determine the need for effluent limits in the draft permit, the draft permit includes WET monitoring and establishes trigger levels for each outfall, that, if exceeded would trigger additional WET testing and, potentially, investigations to reduce toxicity. The trigger levels were calculated based on the WET criteria, receiving water flow, effluent flow, and available dilution. The trigger levels were calculated using the following mass-balance equation (this is basically the same as Equation 7):

$$\text{WET toxicity trigger} = \frac{[\text{criterion} \cdot (Q_e + (Q_u \cdot MZ)] - [C_u\,(Q_u \cdot MZ)]}{Q_e} \quad \text{(Equation 14)}$$

where,

criterion	=	1 TU_c for compliance with the chronic criterion
Q_e	=	effluent flow

Q_u = upstream flow

C_u = upstream concentration = 0 for WET (assuming no upstream toxicity)

MZ = 1, for compliance with chronic criteria (chronic WET testing and triggers are based on 25% dilutions)

Solving equation 13 resulted in the chronic toxicity trigger value of 1.6 TUc during low flow and 2.5 TUc during high flow in the draft permit.

V. Summary of Draft Permit Effluent Limitations

The following summarizes the proposed effluent limits developed for outfall 001.

A. Metals

The technology-based effluent limits applicable to MBC’s discharges were presented in Table D-1. The water-quality based effluent limits for metals applicable to the discharge are shown in Tables D-16 through D-18. The water quality-based effluent limits based on protection of aquatic life were the most stringent limits, therefore, these effluent limits were included in the draft permit.

B. TSS

The State does not have a water quality standard for TSS. Therefore, the TSS limits included in the draft permit are the technology-based limits shown in Table D-1.

C. pH

The State water quality standard for pH is 6.5 - 9.5 standard units for the protection of aquatic life (see Table D-2). The technology-based effluent limits specify a pH of 6.0 - 9.0 (see Table D-1). The draft permit incorporates the more stringent water quality-based minimum of 6.5 and the technology-based maximum of 9.0 standard units.

D. Mass-based Limits

The effluent limitations thus far have been expressed in terms of concentration. However, with a few exceptions, the NPDES regulations (40 CFR 122.45(f)) require that effluent limits also be expressed in terms of mass. The following equation is used to convert the concentration-based limits in ug/L into mass-based limits of lb/day:

$$\text{mass limit} = \text{concentration limit} \cdot Q_e \cdot \text{conversion factor} \qquad \text{(Equation 12)}$$

where,

conversion factor = 0.008346 (units conversion from ug@mgal/L@day to lb/day)

Q_e = effluent flow rate in mgd.

The above equation was used to calculate mass-based limits for outfall 001, where the maximum effluent flow was used to calculate the effluent limits (per the TSD, the flows used to calculate mass-based limits should be consistent with those used to develop the WLAs).

Table D-19: Summary of Proposed Effluent Limitations for Outfall 001					
Parameter	Units	AML		MDL	
		low flow	high flow	low flow	high flow
Ammonia	mg/L	7.8	6.6	16	13
	lb/day	20	58	40	110
Cadmium	ug/L	1.4	1.3	2.7	2.7
	lb/day	0.0035	0.011	0.0068	0.024
Copper	ug/L	11	12	21	24
	lb/day	0.028	0.11	0.053	0.35
Cyanide (WAD)	ug/L	19	18	37	36
	lb/day	0.048	0.16	0.093	0.32
Lead	ug/L	6.9	6.8	14	14
	lb/day	0.017	0.060	0.035	0.12
Mercury	ug/L	0.043	0.042	0.086	0.084
	lb/day	0.00011	0.00037	0.00022	0.00074
pH	su	within the range of 6.5 - 9.0			
Selenium	ug/L	18	17	36	35
	lb/day	0.045	0.15	0.090	0.31
Silver	ug/L	0.66	0.74	1.3	1.5
	lb/day	0.0017	0.0065	0.0033	0.013
TSS	mg/L	20	20	30	30
	lb/day	50	180	75	260
Zinc	ug/L	75	87	150	170
	lb/day	0.19	0.76	0.38	1.5

APPENDIX E - ENDANGERED SPECIES ACT

As discussed in Section VIII.A. of this fact sheet, Section 7 of the Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential affects a federal action may have on threatened and endangered species.

I. Threatened and Endangered Species

According to the USFWS species list 1-4-02-SP-178, the following federally-listed species are in the vicinity of the discharge. The species denoted by a * are under the jurisdiction of NMFS:

<u>Endangered Species:</u>

Gray Wolf (*Canis lupus*) - experimental
Sockeye salmon (*Oncorhynchus nerka*) *

<u>Threatened Species:</u>

Bald Eagle (*Haliaeetus leucocephalus*)
Spring/summer and fall chinook salmon (*Oncorhynchus tshawytscha*) *
Steelhead trout (*Oncorhynchus mykiss*) *
Bull Trout (*Salvelinus confluentus*)
Ute' ladies-tresses (*Spiranthes diluvialis*)

<u>Proposed Threatened Species:</u>

Lynx (*Lynx canadensis*)

In addition to these species, the USFWS has listed two species of concern: wolverine (*Gulo gulo luscus*) and white sturgeon (*Accipenser gentilis*).

II. Consultation History

On May 22, 1992, the National Marine Fisheries Service (NMFS) listed Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha*) as a "threatened" species under the Endangered Species Act. As a result, the USFS engaged in consultation with NMFS under section 7 of the Endangered Species Act. This consultation was conducted by the USFS as "lead agency" on behalf of both EPA and the Corps. As a result of this consultation, NMFS issued a biological opinion (BO) on March 31, 1994, finding that the Mine's operations were not likely to jeopardize the continued existence of salmon. Thus, the existing NPDES permit was not modified.

Subsequently, the 1994 BO was challenged in court by the Idaho Rivers United, the Golden Eagle Audubon society, the Boulder-White Clouds Council, and the Sierra Club, collectively. The applicable legal standard for the challenge was the arbitrary, capricious, or contrary to law standard of the Administrative Procedures Act. Additionally, NMFS reclassified the spring/summer chinook as endangered in 1994, but that reclassification expired in April 1995 so the Snake River chinook are again classified as threatened. Since federal agencies are required to consult on threatened or endangered species, these changes in the classification of the chinook did not affect the need to consult with NMFS.

On November 9, 1995, the U.S. District Court for the Western District of Seattle ruled that the USFS and EPA must reinitiate consultation with regard to the impacts of the Beartrack Mine regarding two species of the Snake River chinook salmon which are classified as “threatened” under the Endangered Species Act. The court found that the BO issued by NMFS, after consultation with the USFS as the lead agency, inadequately considered the impacts of the mining operation on the salmon. Based on its finding that the biological opinion was arbitrary and capricious, the court ordered the agencies to reinitiate consultation with NMFS. The new consultation was required to address deficiencies noted by the court and to take into consideration any other relevant factors, including additional information available about other projects in the Panther Creek watershed. However, the plaintiffs did not request and the court did not order the Mine’s permit to be revoked, therefore, the permit remained in effect.

When NMFS began to reinitiate consultation, they conducted several site studies in the Spring of 1996 to determine whether upstream passage of adult chinook salmon was possible through Napias Falls. NMFS determined that the upper reaches of Napias Creek may have been accessible historically, and thus should be considered as constituting critical habitat. On January 6, 1997, the Secretary of Commerce received a petition from MBC to revise the critical habitat for the Snake River spring/summer chinook salmon in Napias Creek. However, NMFS moved forward on the preparation of the BO and issued a jeopardy decision on March 12, 1999, which identified Reasonable and Prudent Alternatives (RPAs) that would allow the continuation of the activity. The RPAs were directed at several federal agencies, including the EPA for the issuance of the NPDES permit.

Then on October 25, 1999, NMFS published a rule in the federal register revising critical habitat for Snake River spring/summer chinook salmon excluding the areas above Napias Creek Falls from designated critical habitat for this species. However, the RPAs listed in the 1999 BO were not revised and are still in effect. These RPAs under EPA responsibility that apply to the reissuance of this permit are as follows:

RPA #3 NPDES permit levels need to be re-evaluated with special consideration to the mixing zone, upstream metal concentrations, low hardness of the receiving water, and actual discharge flow rates. NMFS concern is that the effluent mixing zone could be a chemical barrier to salmon and steelhead migration. The EPA shall consult with NMFS regarding recalculation of the NPDES permit limits, including development of wasteload allocations and the uncertainty of low hardness in the receiving water.

RPA #5 The EPA shall address the issue of ambient water quality criteria (AWQC) standards, detection limits, and hardness. Detection limits should be at a level that would allow the collection of meaningful water quality information, whether using Idaho water quality criteria or site-specific criteria. Consequently, the Quality Assurance Plan (QAP) requirements must be updated to include the appropriate sample collection, shipping and testing procedures. Additionally, EPA shall implement a metals monitoring strategy to more accurately determine ambient water quality using appropriate detection limits. If the metals are found to exceed AWQC, then an appropriate action plan must be develop that reduces the concentrations to levels that will not adversely affect threatened and endangered species. The evaluation and proposed solutions are to be reviewed and approved by NMFS and incorporated into MBC's Plan of Operations (POO) and NPDES permit. The NPDES permit and standards shall receive NMFS review and concurrence before adoption.

III. NMFS RPAs from 1999 BO Addressed in Proposed NPDES Permit

RPA #3 The wasteload allocations in the current permit were based on estimates of receiving water flow, effluent flow, and the upstream concentrations were assumed to be zero. The wasteload allocations for the draft permit were developed based on measured upstream metal concentrations, and actual receiving water and discharge flow rates. The draft permit also considered the dilution from the mixing zones authorized by the state of Idaho and the low hardness of the receiving water. The following generally discusses the different variables used in development of the effluent limitations proposed in the draft permit. Refer to Section III.D.1 of Appedix D in this fact sheet for more detailed discussion of the development of the wasteload allocation.

<u>Critical Flows</u>

The critical flows used to develop effluent limits in the draft permit are based on measured flows from the USGS gaging station whereas the effluent limits in the current permit were based on a dilution ratio of 30:1 (receiving water to effluent). To obtain the dilution ration, both the receiving water and effluent flow rates were estimated by a contractor for MBC from four months of data from the Napias Creek gage (June through September 1989), basin yields of gaged receiving waters in the region, and average annual precipitation measured at locations within the same region. This analysis only estimated the 1Q10 flow, which would not have adequately protected the duration period for the chronic toxic effects. Additionally, the data shows that between 1996 and 1999 there were 517 days that the actual flow ratio was less than 30:1. This means that the effluent limits in the current permit may not be protective of water quality standards about one third of the time.

EPA recommends the use of the 1Q10 flow and the 7Q10 flow for protection of aquatic life. These hydrologically based flows are similar to a biologically based 1B3 and 4B3 for most streams, which accounts for specific toxicological effects of a pollutant and biological recovery times from localized stresses. The critical flows used for the draft permit were derived from data collected from United States Geological Survey (USGS) station on Napias Creek and corrected to provide the upstream flow by subtracting out the effluent flow rate.

Additionally, the wasteload allocations and effluent limitations were developed for both the high and low flow conditions. The application of tiered effluent limits are more protective of the aquatic environment during the low flow periods because the average flows during this period do not account for the peak flows in May and June. If effluent limits were developed based on the annual averages that included the peak flows, then the resulting effluent limits would have been greater than the proposed limits for the low flow period and would have a higher potential to cause toxic effects during low flow conditions.

Mixing Zones

MBC has recently installed a new diffuser that will decrease the physical boundary of the mixing zone by promoting more rapid mixing in the receiving water than their previous diffuser. The IDEQ will model the mixing zones for the draft permit based on actual receiving water flow, effluent flow data and the new diffuser design to ensure that the chemical mixing zones would not cause a fish migration barrier. IDEQ will provide the results of the model, including mixing zone boundary dimensions, with their certification of this permit under Section 401 of the Clean Water Act. Since outfall 001 is above Napias Falls and Napias Falls has been determined a fish passage barrier and the mixing zones do not extend to Napias Falls, EPA concludes that the mixing zones proposed in this draft permit would not cause a chemical fish migration barrier to salmonids. However, there are bull trout, which is a threatened species under the USFWS, located above Napias Falls that need to be considered in the mixing zone assessment. The physical boundaries and dimensions of the mixing zone(s) will be discussed in the Biological Evaluation submitted to NMFS and USFWS subsequent to EPA receiving a final 401 certification from IDEQ.

The effluent limits in the draft permit are based on actual critical flows in the receiving water and lower dilution volumes (25 percent critical flow volume in the draft permit versus 100 percent critical flow volume in current permit) for protection of aquatic life.

<u>Upstream Concentration</u>

The wasteload allocations used to develop effluent limitations in the current permit assumed upstream concentrations were zero. Since the beginning of mine operations in 1989, MBC has been monitoring the receiving waters monthly at several points in Napias Creek upstream and downstream of Outfall 001. EPA used the receiving water data collected by MBC at Station WQ-22, which is located above Outfall 001 and the confluence of Arnett Creek (see Figure A-3 for monitoring station location), from 1997 through 2000 to calculate upstream concentrations. Therefore, any additional concentration loadings from Arnett Creek are not included in the analysis of the wasteload allocation because there was no data available.

Two difficulties were encountered in evaluating the receiving water data from WQ-22. First, much of the data was reported as non-detect and in some cases the detection limits exceeded the water quality criteria. Second, much of the non-detect data had more than one detection level. Therefore, EPA made the following assumptions for the upstream concentrations in developing the wasteload allocations for the discharge from Outfall 001:

- where all or most of the data were non-detect (<10 detected values), zero was assumed; and
- where all or most of the data were detected (>10 detected values), the 95th percentile of the detected values was assumed.

As a result of these assumptions, the upstream concentration for most parameters were zero, except for ammonia, iron, manganese, nickel, pH, total dissolved solids, total suspended solids, sulfate and turbidity. Therefore, assuming an upstream concentration of zero when most of the data was non-detect at detect levels less than the criteria may allow a larger wasteload allocation than should be allowed and may result in a mixing zone that is larger than what was allowed by the state of Idaho. This may be the case for cyanide, selenium and zinc. Additionally, assuming an upstream concentration of zero when most of the data was non-detect at detect levels greater than the criteria may allow a larger wasteload allocation than should be allowed and may result in the state of Idaho authorizing a mixing zone when the stream is already at or above its capacity for additional loading. This may be the case for cadmium, copper, lead, mercury and silver.

In order to conduct a more accurate assessment in the future, the draft permit has proposed receiving water monitoring using methods that can detect at or below the criteria for Napias Creek.

Effluent Flow

As previously addressed in the critical flow discussion, the wasteload allocations for the current permit were based on an estimated dilution ratio of 30:1. However, this dilution ratio was never enforced through the permit and the data shows that this dilution ratio was not met at least one third of the time. Additionally, the mass loadings in the current permit were based on the estimated effluent low flow of 1.09 mgd that corresponded to the period (May) when dilution ratio was estimated to be 30:1.

For the draft permit, the effluent flows used to calculate the wasteload allocations and effluent loading limits were the maximum flows that the company will discharge for each flow season. The use of the maximum flow allowed the development of effluent limits that are highly probable to be protective of water quality standards.

Hardness

Pollutants with water quality criteria that are affected by hardness that are of concern for this discharge include cadmium, chromium, copper, lead, nickel, silver and zinc. In developing wasteload allocations for the current permit, a receiving water hardness of 10 mg/L as calcium carbonate was assumed. The fifth percentile of measurements downstream of Outfall 001 is 6 mg/L hardness as calcium carbonate during the low flow period and 3.7 mg/L hardness as calcium carbonate.

The water quality standards for the state of Idaho incorporates the toxic criteria set forth in 40 CFR 131.36(b)(1) (i.e., the National Toxics Rule), as of July 1, 1993, which specifies a hardness range of 25 to 400 mg/L as calcium carbonate. When the measured hardness falls below the low end cap for the criteria, the regulation (40 CFR 131.36(c)(4)) states that the minimum hardness allowed for use in the hardness-based equations for the criteria is 25 mg/L as calcium carbonate. Therefore, the hardness used to develop the wasteload allocation for the draft permit was 25 mg/L as calcium carbonate.

As a comparative analysis, the differences in using a hardness of 25 mg/L as calcium carbonate versus the actual hardness are provided in the following tables. Table E-1 provides a comparison of the criteria, Table E-2 compares the differences in the mixing zones, Table E-3 shows the differences in the reasonable potential determination, Table E-4 indicates the differences in the effluent limitations, and Table E-5 contains the comparison of the actual compliance evaluation levels.

The main difference between using the actual hardness and a hardness of 25 mg/L as calcium carbonate is that an effluent limitation for nickel would be required using actual hardness. For this reason, the draft permit proposes monitoring of the effluent and receiving water for nickel. Additionally, most of these pollutants are at or below the capability of current analytical technology approved by EPA in 40 CFR 136. Therefore, the minimum level (or quantification level) for the best available analytical technology becomes the compliance evaluation level. This resulted in compliance evaluation levels that are essentially the same, with the exception of zinc, even though the effluent limits for the actual hardness may be lower than effluent limits based on a hardness of 25 mg/L.

Table E-1: Comparison of Hardness-Based Aquatic Life Criteria									
Parameter	Units	Actual Hardness				25 mg/L Hardness			
		Acute Criteria		Chronic Criteria		Acute Criteria		Chronic Criteria	
		low flow (h=6.0 mg/L)	high flow (h=3.7 mg/L)	low flow (h=6.0 mg/L)	high flow (h=3.7 mg/L)	low flow	high flow	low flow	high flow
Cadmium	ug/L	0.16	0.09	0.13	0.13	0.82	0.82	0.37	0.37
Chromium	ug/L	71	52	28	28	192	192	68	68
Copper	ug/L	1.2	0.8	1.0	1.0	4.6	4.6	3.5	3.5
Lead	ug/L	2.7	1.5	0.11	0.11	14	14	0.54	0.54
Nickel	ug/L	131	86	15	15	438	438	49	49
Silver	ug/L	0.03	0.01	---	---	0.32	0.32	---	---
Zinc	ug/L	11	6.9	9.6	9.6	35	35	32	32

Table E-2: Comparison of Mixing Zone Dilutions for Hardness-Based Aquatic Life Criteria (expressed as percent of receiving water flow)				
Parameter	Actual Hardness		25 mg/L Hardness	
	low flow (h=6.0 mg/L)	high flow (h=3.7 mg/L)	low flow	high flow
Cadmium	25	25	25	25
Chromium	0[1]	25	0[1]	0[1]
Copper	25	25	25	25
Lead	25	25	25	25
Nickel	25	25	25	25
Silver	25	---	25	---
Zinc	25	25	25	25

Footnote:
1. A mixing zone was not necessary for this parameter because reasonable potential was not determined when no dilution was used in the calculations.

Table E-3: Comparison of Reasonable Potential Analysis for Hardness-Based Aquatic Life Criteria				
Parameter	Actual Hardness		25 mg/L Hardness	
	low flow	high flow	low flow	high flow
Cadmium	y	y	y	y
Chromium	n	n	n	n
Copper	y	y	y	y
Lead	y	y	y	y
Nickel	n	y	n	n
Silver	y	y	y	y
Zinc	y	y	y	y

Table E-4: Comparison of Hardness-Based Effluent Limitations

Parameter	Units	Actual Hardness				25 mg/L Hardness			
		AML		MDL		AML		MDL	
		low flow	high flow	low flow	high flow	low flow	high flow	low flow	high flow
Cadmium	ug/L	0.27[1]	0.17[1]	0.55	0.30[1]	1.4	1.3	2.7	2.7
	lb/day	0.00068	0.0015	0.0014	0.0026	0.0035	0.011	0.0068	0.024
Copper	ug/L	2.8[2]	1.9[2]	5.5	3.9[2]	11	12	21	24
	lb/day	0.0070	0.017	0.014	0.034	0.028	0.11	0.053	0.35
Lead	ug/L	1.4[3]	1.3[3]	2.7[3]	2.7[3]	6.9	6.8	14	14
	lb/day	0.0035	0.011	0.0068	0.024	0.017	0.042	0.035	0.12
Nickel	ug/L	---	66	---	130	---	---	---	---
	lb/day	---	0.58	---	1.1	---	---	---	---
Silver	ug/L	0.057[4]	0.027[4]	0.11[4]	0.054[4]	0.66[4]	0.74[4]	1.3	1.5
	lb/day	0.00014	0.00024	0.00028	0.00047	0.0017	0.0065	0.0033	0.013
Zinc	ug/L	22	17	45	33	75	87	150	170
	lb/day	0.055	0.15	0.11	0.29	0.19	0.76	0.38	1.5

Footnotes:

1. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 0.5 u/L using EPA Method 213.2.
2. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 5 u/L using EPA Method 220.2.
3. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 5 u/L using EPA Method 239.2.
4. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 1.0 u/L using EPA Method 272.2.

Table E-5: Comparison of Compliance Evaluation Levels									
Parameter	Units	Actual Hardness				25 mg/L Hardness			
		AML		MDL		AML		MDL	
		low flow	high flow	low flow	high flow	low flow	high flow	low flow	high flow
Cadmium	ug/L	0.5	0.5	0.55	0.5	1.4	1.3	2.7	2.7
	lb/day	0.0013	0.0044	0.0014	0.0044	0.0035	0.011	0.0068	0.024
Copper	ug/L	5.0	5.0	5.5	5.0	11	12	21	24
	lb/day	0.013	0.044	0.014	0.044	0.028	0.11	0.053	0.35
Lead	ug/L	5.0	5.0	5.0	5.0	6.9	6.8	14	14
	lb/day	0.013	0.044	0.014	0.044	0.017	0.060	0.035	0.12
Nickel	ug/L	---	66	---	130	---	---	---	---
	lb/day	---	0.58	---	1.1	---	---	---	---
Silver	ug/L	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.5
	lb/day	0.0025	0.0088	0.0025	0.0088	0.0025	0.0088	0.0033	0.013
Zinc	ug/L	22	17	45	33	75	87	150	170
	lb/day	0.055	0.15	0.11	0.29	0.19	0.76	0.38	1.5

RPA #5 The method detection levels for the analytical testing required in the draft permit, for both effluent and receiving water monitoring, are at a level that would provide useful environmental information (i.e., less than the AWQC for receiving water monitoring) and determine compliance with the permit (i.e., less than the effluent limitation). EPA has also required the applicant to update their Quality Assurance Plan (QAP) and has included some specific requirements to ensure a satisfactory QAP.

The effluent limits in the draft permit are based upon the applicable Idaho water quality criteria for Napias Creek. The proposed permit requires MBC to report any exceedances of the effluent limits or any noncompliance that may endanger the environment within 24 hours. MBC must also report on the steps taken to reduce, eliminate, and prevent recurrence of the noncompliance. Depending upon the nature and extent of the violations, EPA will determine what further action(s) are necessary, which may include the investigations described in this RPA item. In addition, the draft permit requires downstream monitoring to determine the effectiveness of the proposed effluent limits. Should this monitoring indicate that the effluent limits are not effective in protecting Idaho water quality standards, then the permit may be modified to adjust the effluent limits.

APPENDIX F - ESSENTIAL FISH HABITAT

As discussed in Section VIII.B. of this fact sheet, the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) regarding potential affects a federal action may have on essential fish habitat (EFH). The NMFS has requested that EFH assessments contain the following requirements:

Action Agency
US Environmental Protection Agency, Region 10

Project Name
Reissuance of the National Pollutant Discharge Elimination System (NPDES) permit to Meridian Beartrack Company (MBC) for the Beartrack Mine.

Species in the Vicinity of the Project
The Salmon-Panther Subbasin, HUC 17060203, has been designated to support chinook salmon (Oncorhynchus tshawytscha) for EFH, according to NMFS website at:

http://www.nmfs.noaa.gov/habitat/habitatprotection/efh_designations.htm

Description of the Project/Proposed Activity
The facility activities are described in Part II of this fact sheet, wastewater sources are described in Appendix C, and the discharge location is described in Part IV.A.

Evaluate Potential Effects to EFH
The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge for the following reasons:

1. The proposed permit has been developed in accordance with the Idaho water quality standards to protect aquatic life species in Napias Creek. NPDES permits are established to protect water quality in accordance with State water quality standards. The standards are developed to protect the designated uses of the waterbody, including growth and propagation of aquatic life and wildlife. Self-monitoring conducted by the applicant indicates that the facility will be able to comply with all limits of the proposed permit.

2. The derivation of permit limits and monitoring requirements (refer to Section III of this fact sheet for specifics pertaining to the proposed permit) for an NPDES discharger are in accordance with state water quality standards using procedures prescribed in the TSD (EPA, 1991).

3. On October 25, 1999, NMFS published a rule in the federal register revising critical habitat for Snake River spring/summer chinook salmon excluding the areas above Napias Creek Falls from designated critical habitat for this species.

Therefore, it is concluded that there are no critical habitats in the vicinity of the discharge for any species of chinook salmon.

4. The draft permit implements/addresses the Reasonable and Prudent measures for protection of chinook salmon identified by NMFS in the 1999 BO.

APPENDIX G - REFERENCES

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